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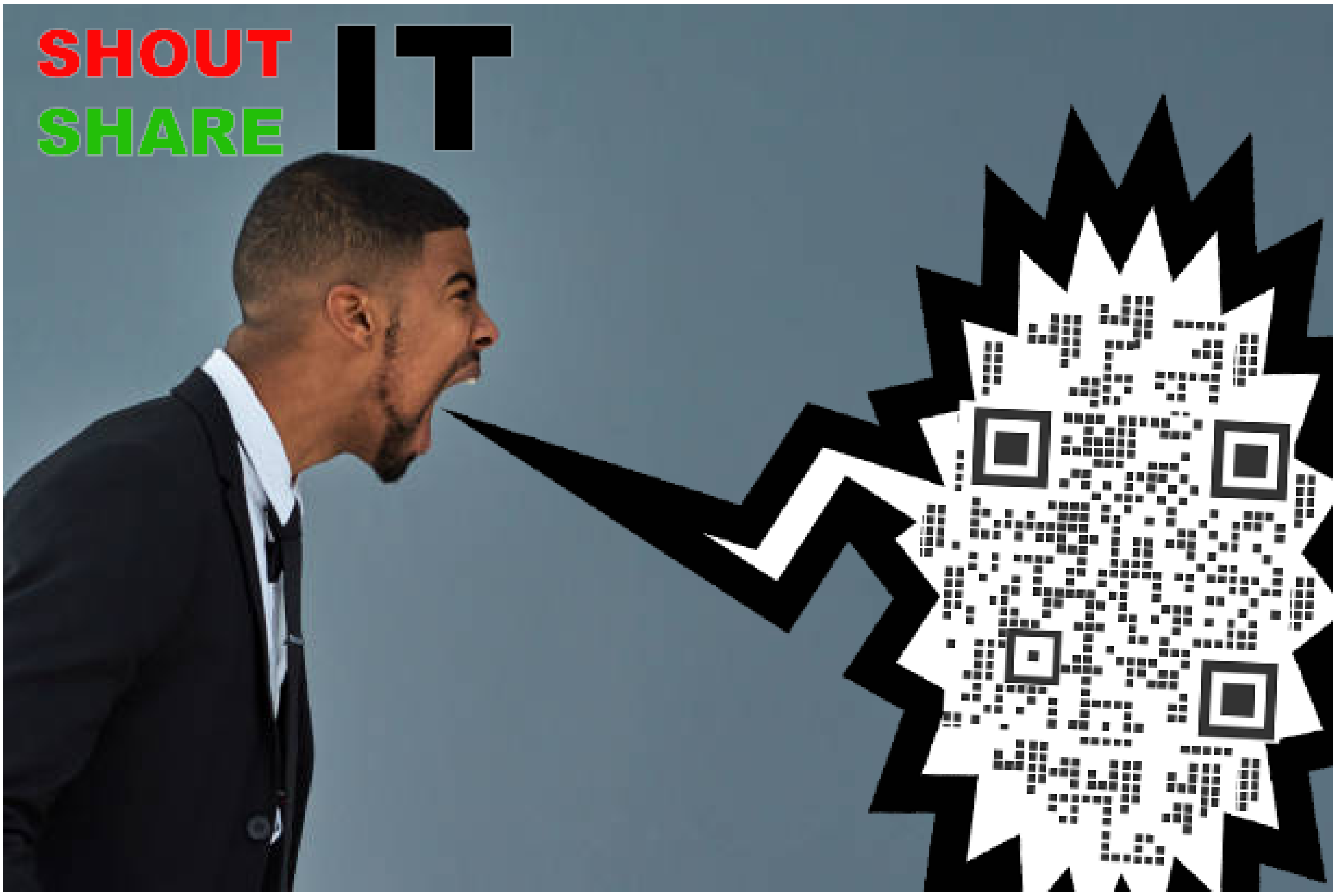
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23, last line but one, read *Gigartina, Constantinea.*

171, lines 33, 34, delete the sentence within parentheses (which . . . *coccinea*).

196, line 17, read LEICHHARDT.

206 ,, 3, ,, *R. Br.*

211 ,, 5, ,, LEICHHARDTII.

,, ,, 17, ,, *Leichhardt.*

246 ,, 2 from bottom, read FINETIANUM.

256 ,, 1, for VIRIDFLORA read VIRIDIFLORA.

257 ,, 26, for EICHORNIA read EICHHORNIA.

320 ,, 10, read SYLVICOLA.

352 ,, 24, ,, LUCUMA.

360 ,, 9, ,, *obovata.*

373 ,, 1, ,, C. B. Clarke.

THE JOURNAL

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THE LINNEAN SOCIETY.

(BOTANY.)

A Review of the Genus *Chlorochytrium*, Cohn.

By B. MURIEL BRISTOL, M.Sc.
(Communicated by Prof. G. S. WEST, M.A., D.Sc., F.L.S.)

(PLATES **1–3**, and 1 Text-figure.)

[Read 21st November, 1918.]

INTRODUCTION.

WILLE has said* that "there is no doubt that the subfamily Endosphæraceæ consists of very nearly related forms." How nearly related they are he evidently did not realize, since he regarded *Chlorochytrium*, Cohn, *Chlorocystis,* Reinh., *Stomatochytrium*, Cunningh., *Endosphæra*, Klebs, *Scotinosphæra*, Klebs, and *Centrosphæra*, Borzì, as independent genera, despite the fact that the generic limitations were such that investigators of this group of algæ have frequently expressed themselves to be doubtful with which genus they were working. In 1904, however, Prof. G. S. West † pointed out that the differences between *Chlorochytrium*, Cohn (1874), and *Stomatochytrium*, Cunningh. (1888), can scarcely be regarded as of generic importance, and submerged Cunningham's genus in that of Cohn, thus beginning a simplification of the confusion existing among these algæ. At a later date ‡ he went much further in stating that the distinctions which form the basis of the separation of the so-called "genera" *Endosphæra*, Klebs, *Scotinosphæra*, Klebs, and *Chlorocystis*, Reinh., from the genus *Chlorochytrium*, Cohn, are of no taxonomic value among the lower algæ, in submerging them all in the genus *Chlorochytrium,* and finally in changing the name of the subfamily from Endosphæraceæ to Chlorochytrieæ.

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* Wille, N. Die Natürlichen Pflanzenfamilien, i. Abt. 2, p. 64 (1897).

† West, G. S. 'British Freshwater Algæ.' Camb. Biol. Series, p. 198 (1904).

‡ West, G. S. 'Algæ.' Camb. Bot. Handbooks, vol. i. (1916) p. 212.

It was shown in addition[*], in 1917, in the course of an extended investigation of a new species eventually named *Chlorochytrium grande,* that there are a number of very good reasons for regarding Borzì's "genus" *Centrosphæra* also merely as a species of the wider genus *Chlorochytrium;* so that the genus, as it now stands, includes not only those species originally described under the generic name *Chlorochytrium,* Cohn, but also those described under the names *Chlorocystis,* Reinh., *Stomatochytrium,* Cunningh., *Endosphæra,* Klebs, *Scotinosphæra,* Klebs, and *Centrosphæra,* Borzì; while the subfamily Chlorochytrieæ comprises but four genera—viz., *Chlorococcum,* Fries, *Chlorochytrium,* Cohn, *Phyllobium,* Klebs, and *Dictyococcus,* Gerneck.

Gardner [†], in describing a new species of *Chlorochytrium* later in the year 1917, substantiated Prof. West's statements, at any rate in so far as the "genus" *Chlorocystis* is concerned; while the following investigation of an alga which can certainly be no other than that described by Klebs as *Scotinosphæra paradoxa,* shows beyond any question of doubt that Prof. West's statements hold also for the "genus" *Scotinosphæra,* Klebs.

During the course of the present work, a study of the literature published on the genus *Chlorochytrium,* in its wider sense, has shown that there is almost as much confusion among the species as there was among the "genera"; hence Prof. West suggested that this would be a good opportunity for a general review of the genus with a view to the simplification of the species.

In all cases where possible a careful examination of the original descriptions and figures has been made, supplemented in the two species *C. Lemnæ* and *C. paradoxum* by an investigation of the alga itself, both in the living condition and by means of stained sections. The observations made on these two species, together with those made in connection with *C. grande* [‡], have shown that certain features which have been regarded in the past as characteristic of a species or even of a genus can no longer be considered as such, since they are found to vary considerably in different individuals of the same species. For example, the shapes of the cells and the nature and extent of the thickenings of the cell-wall have been found to show very considerable variation in both of the species *C. paradoxum* (Pls. **2** & **3.** figs. 17–30) and *C. grande,* even though there was no external pressure of surrounding host-tissue to affect the cells; Wright has also observed that in *C. Cohnii* those individuals developed in the interior of the cell-tissue of the host are completely destitute of the cellulose protuberance so characteristic of the cells growing just below the epidermis*.

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[*] Bristol, B. M. "On the life-history and cytology of *Chlorochytrium grande,* sp. nov." Annals of Botany, vol. xxxi. Jan. 1917.

[†] Gardner, N. L. "New Pacific Coast Marine Algæ, I." Univ. California Publ. in Botany, vol. vi. no. 14, June 1917.

[‡] Bristol, *loc. cit.*

Again, much stress has been laid upon the form and size of the chromatophore, Reinhardt using these characters as the basis of his new genus *Chlorocystis*. Moore † and Gardner ‡ have shown, however, that in the species they have examined the shape and extent of the chromatophore vary very considerably in the same individual at different stages of its existence; the same is true to a certain degree for *Chlorochytrium grande* and for the two species investigated in this paper.

Further, specific distinction has been made on the basis that in some cases the zoogonidia fuse to form zygotes, while in others they develop asexually without any such fusion taking place. In *C. Limnanthemum*, however, Cunningham has observed § that though as a general rule the zoogonidia fuse to form zygotes, yet if fusion does not take place, the zoogonidia are able to develop asexually in exactly the same manner as do the zygotes. The same condition has been recorded for other nearly related forms, showing that in these lower algæ the fusion of exactly similar zoogonidia cannot be regarded as a true sexual fusion, but only as a case of gamogenesis. Hence the separation into different species of two algæ which differ as to the fusion of their zoogonidia but agree in all other particulars, can only be regarded as an unnecessary multiplication of names of no real value.

Considerations of this kind have been kept constantly in mind in revising the arrangement of the species of *Chlorochytrium*, and with their help it has been possible in certain cases to reduce the number of species. It is very noticeable that whereas certain of the described species stand out as being quite different from the rest, yet others fall naturally into distinct groups, the members of which resemble one another very closely but differ from all the other groups in certain important particulars. This rather suggests that the groups are made up of forms which have been separated into species on the basis of characters which are not of sufficient importance or stability in themselves to rank as specific characters, and that they are, at most, only variations of one species.

A typical group of this kind is that which includes the species *C. Lemnæ*, Cohn, *C. Knyanum*, Cohn & Szymanski, *C. pallidum*, Klebs, and *C. Archerianum*, Hieron.; and it is significant that the last two species have not again been recorded since their first description.

---

* Whitting, F. E. "On *Chlorocystis Sarcophyci*, a new endophytic Alga." In G. Murray, Phyc. Mem., Part II. p. 43 (1893).

† Moore, G. T. "New or little known Unicellular Algæ: I. *Chlorocystis Cohnii*." Bot. Gaz. vol. xxx. (1900) p. 100.

‡ Gardner, N. L., in Univ. Calif. Publ. Bot. vi. no. 14 (1917).

§ Cunningham, D. D. "On an endophytic Alga occurring in the leaves of *Limnanthemum indicum* . . ." Sci. Mem. Medical Officers of Army of India, Ed. Sir Benj. Simpson, Part III. (1887) pp. 33–40.

I. CHLOROCHYTRIUM LEMNÆ, Cohn.

This species was established by Cohn* in 1872, and forms the basis of the genus *Chlorochytrium*. Cohn states that the alga is an endophytic green unicell in which multiplication takes place by means of numerous zoogonidia produced by free cell-division, first into large segments and later into innumerable pear-shaped green bodies which are extruded through the tubular process on the cell-wall.

Kirchner† observes that the zoospores are set free sometimes through a split in the cell-wall into the intercellular spaces of the host, and sometimes through the tubular projection of the wall.

Klebs ‡ found that the spherical, biciliate zoogonidia are formed by a successive bipartition of the green contents of the mother-cell. The liberation of the zoospores is effected by an absorption of water by the mother-cell resulting in a splitting of the cell-wall and of the superposed *Lemna* tissues, the zoogonidia being extruded through the slit in a mass of mucilage within which they fuse in pairs to form quadriciliate zygospores. The part of the germinating zygospore remaining on the surface of the leaf is converted into a spherical stopper of cellulose. According to Klebs, the chloroplast in the young cell forms a continuous parietal layer which, in later stages of development, sends out green protoplasmic strands to the centre of the cell, where they anastomose to form a much-branched network. Pyrenoids are present.

Spencer Moore § suggested that the biciliate gametes might possibly act as facultative zoogonidia, though his evidence was incomplete.

De Toni ‖ added that the cells vary in size and shape, and that each contains a single nucleus and disc-shaped chloroplasts; while Wille ¶ described the chloroplast as a continuous parietal layer with internally projecting ledges or rods and containing many pyrenoids.

In Oct. 1916, and again in Jan. 1917, a quantity of *Lemna trisulca* was collected from a pond near Quinton in Worcestershire, and was found on examination to contain enough *Chlorochytrium Lemnæ* for a study of its cytology by means of sections. The large size of the endophytic cells and the density of their green colour, together with the thickness of the superposed *Lemna* tissues, made it impossible to come to any definite conclusions

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[*] Cohn, F. "Ueber parasitische Algen." Beiträge zur Biologie der Pflanzen, vol. i. p. 87.

[†] Kirchner, O. 'Die Algen Schlesiens.' Breslau, 1878.

[‡] Klebs, G. "Beiträge zur Kenntniss niederer Algenformen." Bot. Zeit. xxxix. (1881) col. 249–255, pls. 3, 4.

[§] Moore, Spencer. "Remarks on some endophytic Algæ." Journ. of Bot. xxii. (1884) pp. 136–138.

[‖] De Toni, J. B. Sylloge Algarum, i. pp. 635–636 (1889).

[¶] Wille, N. Die Natürlichen Pflanzenfamilien, i. Abt. 2, p. 66 (1897).

as to the shape and extent of the chloroplast or the nature of the cell-contents from the mere examination of living material; also the material stained in bulk gave no results of any value. Hence carefully selected *Lemna* fronds containing a large number of *Chlorochytrium* cells were fixed with Bouin's solution, embedded in paraffin and cut into sections 5–10 μ thick. The sections thus obtained were stained with Delafield's hæmatoxylin or with Heidenhain's iron-alum-hæmatoxylin and mounted in Canada Balsam.

Sections prepared in this way show that the endophytic cells are situated in the intercellular spaces of the host-plant, and are possessed of a firm cellulose cell-wall varying in thickness from 1–1·5 μ. Only very occasionally were the cells cut through in such a manner as to show the tubular prolongation of the wall (see Pl. **1**. fig. 1), and in no case was a cellulose button found at the end of the tube. The cells in some cases are sub-spherical or ellipsoid, but in others quite irregular, evidently from the pressure of the surrounding tissue of the host. Each contains a single more or less centrally placed nucleus, bounded by a nuclear membrane and containing a large karyosome; in some cases a few granules could be seen in the nuclear space, but these did not seem to be of a chromatic nature.

From serial sections it has been possible to reconstruct the internal structure of the cell, and the examination of a number of cells has shown that, though the chloroplast is always built up on the same principle, yet it is subject to so much variation in individuals that there is little wonder that it has been described so variously in the past. Figs. 2, 3, and 4 (Pl. **1**) represent radial sections of fairly typical specimens taken through the nucleus. From these it is seen that there is a single chloroplast consisting of a small central mass surrounding the nucleus, and a varying number of radiating branches which spread out on reaching the periphery of the cell and flatten themselves against the cell-wall. In many cases these parietal portions seem to be fused together so that from the outside there appears to be a more or less continuous parietal chloroplast with internally projecting ledges or rods, as described by Klebs and Wille. That this is probably not the case is shown in fig. 7 where several of the parietal portions of the chloroplast are quite separate from one another, and in fig. 8 where there is no fusion at all. It must have been a preponderance of cells in this condition that led De Toni to describe them as containing disc-shaped chloroplasts.

Again, individuals were found such as those represented in figs. 9–11, in which the central portion and the radiating branches of the chloroplast were very much reduced and the parietal portions correspondingly developed, so that there appears to be astonishingly little difference between the chloroplasts of these particular cells and the truly parietal chloroplast figured by Freeman* for *Chlorochytrium inclusum*. On the other hand, it can be seen from figs. 1, 14, and 16 that variation may also occur in that the central part and the radiating branches become very strongly developed, producing a much more massive chloroplast, somewhat reminiscent of that described for *Chlorochytrium grande.*

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* Freeman, E. M. "Observations on *Chlorochytrium*." Minnesota Bot. Studies, vol. ii. Part III. 1898 (?).

Pyrenoids are present in the cell, the number varying considerably in different individuals. They are usually situated in the parietal portion of the chromatophore, often just at the junction of a radiating branch, though in some cases they may be nearer the centre of the cell. Starch is present both in the starch-sheaths of the pyrenoids and in the form of small scattered granules.

Of the other forms very closely resembling *C. Lemnæ*, *C. Knyanum* has been recorded from *Lemna minor* and *gibba*, *Ceratophyllum demersum*, and *Elodea canadensis.* It was first described, but not named, by Kny [*] in 1874 as an endophytic alga, differing from *C. Lemnæ* only in size and in the absence of a cellulose button at the end of the tubular neck. Four years later Szymanski [†] found a form which was apparently identical with that described by Kny, but which possessed a cellulose button not protruding further than twice the thickness of its outer wall above the epidermis of the host-plant. Kirchner [‡] recorded the species from Breslau in the same year, and Klebs [§], in 1881, added the information that only asexual zoogonidia were produced. He further suggested that it bore such a very striking resemblance to *C. Lemnæ* that it was probably only an asexual form of the same species.

The fourth species of this group, *Chlorochytrium Archerianum*, was established by Hieronymus [‖] in 1887, though the alga had been described and figured earlier by Archer [¶], who, however, thought that it was most probably a stage in the life-history of *Chlamydomyxa labyrinthuloides.* It was found in punctured cells of *Sphagnum*, and very closely resembles *C. Lemnæ*, with the difference that it is characterised at maturity by a usually strongly developed cellulose button, and that its zoogonidia do not fuse.

The separation of these four species is thus based on three characters: the size of the cell, the degree of development of the cellulose button, and the fusion of the zoogonidia. A study of algæ belonging to this group, extending over a period of more than two years, has convinced me that the instability of these characters in the forms that have come under my observation is far too conspicuous to justify their being regarded as the sole bases of specific distinction in other nearly related forms. Hence, the only logical course to adopt is to merge the four species into one under the name *Chlorochytrium Lemnæ*. Whether the cells of *C. pallidum*, Klebs, are sufficiently constant in size to justify its being regarded as a special variety under the name *C. Lemnæ*, Cohn, var. *pallidum*, Klebs, or whether it is merely a "place-variety" of the typical form, as Klebs and Freeman have suggested, is a question of little importance, and could only be determined from a prolonged study of the living alga. That the size of the cellulose stopper is subject to variation is shown by the different statements made by Kny and by Szymanski with respect to the "species" *C. Knyanum*.

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[*] Kny, L. "Ueber eine grüne parasitische Alge." Sitz. Gesellsch. naturf. Freunde zu Berlin, 1874.

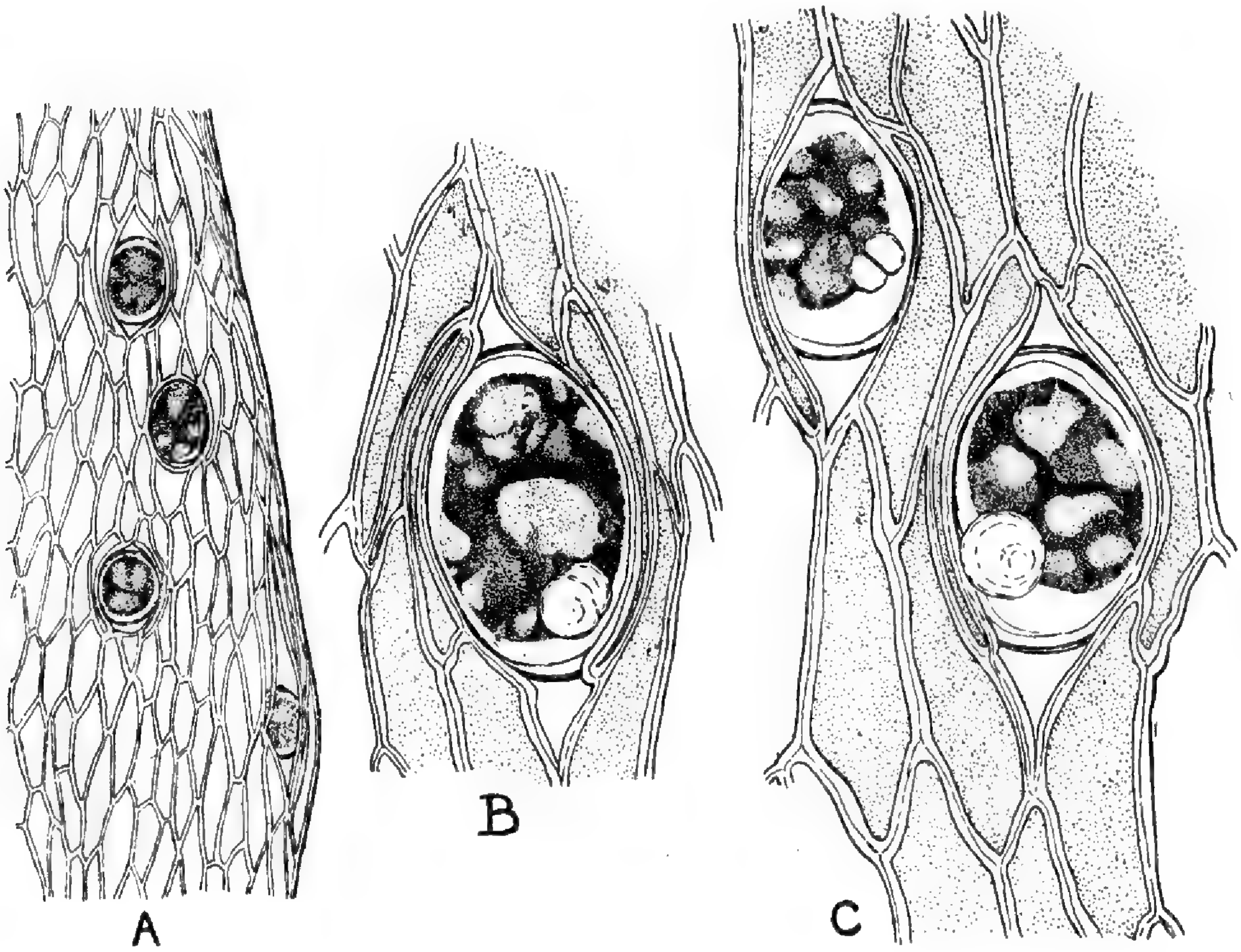
[†] Szymanski, F. "Ueber einige parasitische Algen." Inaug.-dissert. der Univ. Breslau, 1878.

[‡] Kirchner. 'Die Algen Schlesiens,' 1878.

[§] Klebs, G. Bot. Zeit. xxxix. (1881) col. 255-257.

[‖] Hieronymus. Jahresber. Schles. Gesellsch. 1887, p. 296.

[¶] Archer, W. "On *Chlamydomyxa labyrinthuloides*, nov. gen." Quart. Journ. Micr. Sci. vol. xv. p. 120, tab. 7. f. 1.



Text-figure 1.—*Chlorochytrum Lemnæ* in leaves of *Bryum pseudotriquetrum*.

A. Part of *Bryum* leaf with endophytic *Chlorochytrium* cells, ×144; B & C. Individual *Chorochytrium* cells, showing button-like excrescence and form of chloroplast: the endophyte has caused a splitting apart and crushing of the adjacent *Bryum* cells, ×535. [N.B.—Details of internal structure of *Bryum* cells omitted.]

In this connection it is interesting to note that a form of *C. Lemnæ*, recently sent to the Laboratory for identification, occurred in the leaves of

Bryum pseudotriquetrum. In this form it was observed that the tubular neck was absent, probably on account of the extremely thin leaves of the host-plant, but there appeared to be a large button-shaped outgrowth on the surface of the wall of many of the cells. These bodies were always seen from a surface and never from a lateral view, hence their connection with the cell-wall could not definitely be established in this specimen, which was mounted as a permanent preparation, but the alga bore a very strong resemblance to *C. Archerianum*, Hieron., as figured by Archer. In all other respects, however, especially in the characters of the chloroplast, this alga agreed with *C. Lemnæ*, and it was therefore regarded merely as a place-variety of the typical form.

II. CHLOROCHYTRIUM BIENNE (Klebs), G. S. West.

This species was first described by Klebs [*], in 1881, under the name *Endosphæra biennis*. The cells are spherical, lying in the intercellular spaces of the sub-epidermal parenchyma of the host. By successive bipartition the contents of each cell divide into a number of daughter-cells, from each of which, by a further successive bipartition, 8–16 similar spherical zoogonidia arise which conjugate just at the opening of the mother-cell-wall to form quadriciliate zygotes. These germinate and penetrate the tissues of the host exactly as do the zygotes in *Chlorochytrium Lemnæ*, but the germinating tube and the part of the zygospore remaining on the surface of the leaf soon die away.

Wille [†] adds that the chromatophore forms a continuous parietal layer with inwardly projecting ridges or rods and containing many pyrenoids, so that it is evidently of the same type as that described above for *C. Lemnæ*. He sees in the preliminary divisions of the cells before zoogonidia-formation a modified form of vegetative division.

III. CHLOROCHYTRIUM PARADOXUM (Klebs), G. S. West.

This species was observed by Klebs [‡], in 1881, in the dead or dying tissues of *Lemna trisulca*, and was described by him under the name *Scotinosphæra paradoxa*. He states that the cells are mostly spherical, showing at maturity a differentiation of the green protoplasm into cylindrical or spherical masses; and that, as a result of very complicated changes in the cell, numerous, biciliate, spindle-shaped, asexual zoogonidia are formed. From Klebs's figures it is seen that the cell-wall bears a conspicuous peg-like thickening on one side.

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[*] Klebs, G. "Beiträge zur Kenntniss niederer Algenformen." Bot. Zeit. xxxix (1881) col. 329–336.

[†] Wille, N. Die Natürlichen Pflanzenfamilien, i. Abt. 2, pp. 61, 66 (1897).

[‡] Klebs, G. Bot. Zeit. xxxix. (1881) col. 300.

De Toni (1889)* adds that the resting-cells may be globose or ellipsoid, with a wall which is stratified and thick, and here and there especially thickened; while Wille (1897)† describes the chromatophore as a thin parietal layer with radially disposed rods.

Except that this species was recorded by Spencer Moore (1884)‡, no other information has been obtained up to the present. Recently, however, a considerable amount of an alga has been obtained from cultures of two soils, which can be no other than the species under consideration. The samples of soil were both taken in October 1915 from old gardens, one in Staffordshire and one in Wiltshire, and after being air-dried for nearly six weeks, small quantities of the soils were examined by means of water-cultures for any algæ they might contain. The culture-media used were rain-water and mineral-salt solutions of different strengths. Foreign infection of the cultures was carefully avoided by a complete sterilization of all materials and vessels used, so that it could safely be said that any algæ appearing in the cultures could have originated only from resting forms present in the soil. The appearance of cells of *Chlorochytrium paradoxum* in these cultures is all the more remarkable in consideration of the endophytic and frequently aquatic habit usually so characteristic in this group of algæ. The material has, however, been kept under observation for a period of nearly two years, and no other conclusion is possible than that this identification is the correct one. Owing to the preliminary drying of the soils, the cultures contained at first only developmental stages of algæ which it was impossible to identify, and it was not until October 1916 that the presence of *C. paradoxum* was suspected, while the full observation of the life-history was not completed until October 1917.

The cultures contained a number of species of blue-green algæ, chiefly belonging to the genus *Phormidium*, the filaments of which became interwoven to form a flat expanded stratum in which the *Chlorochytrium* cells were imbedded. The habitat of the plant in this case thus very closely resembles that recorded by Borzì for the species originally described by him as *Centrosphæra Facciolæ* §, so that the species forms another link between the entirely endophytic forms and *C. grande*, which has only been observed in a free state.

The cells of *Chlorochytrium paradoxum*, as observed in the present work, are extremely variable both in shape and size. They may be spherical, subspherical, ellipsoid, pear-shaped, triangular, or variously irregular; apparently mature cells have been observed whose sizes varied from 35 × 50 μ to

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* De Toni, J. B. Sylloge Algarum, i. pp. 639–640 (1889).

† Wille, N. Die Natürlichen Pflanzenfamilien, i. Abt. 2, p. 66 (1897).

‡ Moore, Spencer. "Remarks on some endophytic Algæ." Journ. of Bot. xxii. (1884) pp. 136–138.

§ Borzì, A. Studi Algologici, Fasc. i. pp. 87–97. Messina, 1883.

$63 \times 165\,\mu$, while one pear-shaped cell in which the division of the contents was observed measured $105\,\mu$ broad and $178\,\mu$ long.

The cell-wall consists of cellulose, and is frequently not more than $2\,\mu$ thick, though it may increase at the time of zoogonidia-formation to about $3{\cdot}5\,\mu$, when it shows a few faint striations. It usually bears on its outer surface one or more finely-striated projections formed by the unequal thickening of the cell-wall, though in some individuals no such projections were ever produced even at maturity. The form and extent of the thickenings varies considerably in individual cells (Pl. **2.** figs. 17–23). As a general rule the inner surface of the cell-wall bears no special thickenings, but in a few cells such as those shown in figs. 17 and 18 internal projections were present. These, however, were never found to be of any great size and were observed only rarely, but their occasional presence shows to what a considerable extent the development of the cell-wall is liable to individual variation.

The living cells differ in appearance according to their state of development. Young cells and others which have grown quickly show quite clearly that the protoplasm is differentiated into two parts—a colourless part and a chloroplast. An optical section of a living cell (Pl. **3.** figs. 25 & 27) shows that the chloroplast is of the same type as that described for *C. Lemnæ*, though the radiating branches are somewhat more robust, and the parietal portions are frequently less expanded and rarely fused together ; in many cases a surface view gives the impression that the cell contains a number of discoid parietal chloroplasts (fig. 26). As the cell approaches maturity the radiating branches seem to increase in number, so that the cell-contents assume a very much darker green colour, and the internal structure becomes very difficult to make out from the living material. Eventually the cell appears to be homogeneously green.

That this is not true, however, is seen from stained sections of the cells, cut in paraffin after fixation with Flemming's weaker solution. The sections were 4–$8\,\mu$ thick, and were stained with Delafield's hæmatoxylin or with Heidenhain's iron-alum-hæmatoxylin. In sections prepared in this way the nucleus is seen to be displaced a little from the centre of the cell, its place being taken by a large pyrenoid. It is evidently this pyrenoid that produces the clear space so noticeable in the centre of the chloroplast of some living cells (fig. 25). The pyrenoid has a large irregular-shaped pyrenocrystal, and a number of very distinct starch-plates forming a somewhat irregular starch-sheath. In a mature cell such as that represented in figs. 28–30 the chloroplast is seen to be massive, consisting of a small axial portion with repeatedly branched arms radiating out from the central pyrenoid and practically filling the whole cell ; within the cytoplasm of the chloroplast a very fine reticulum can clearly be made out. The branches of the chloroplast are separated from one another by colourless strands of cytoplasm, and a few small pyrenoids are scattered through the cell. The nucleus is bounded by a nuclear membrane, and contains a single very large karyosome and a nuclear network in which are imbedded a few distinct granules; these, however, do not appear to be composed of chromatin. A quantity of starch is present in the form of small granules scattered throughout the cell.

Though the structure of the vegetative cell thus bears a striking resemblance to that of *C. Lemnæ*, yet the mode of zoogonidia-formation differs considerably, and it is upon this character that the separation of the two species mainly depends. The chlorophyll-containing portion of the cytoplasm contracts from the cell-wall and forms a more or less irregularly globular, homogeneous, green mass in the centre of the cell, and the space between this central mass and the cell-wall is seen to be filled with a large number of orange- or reddish-coloured granules. Even before it is properly rounded off the central green mass divides by constriction into two parts, and by a further successive bipartition of each of these eventually a large number of rounded bodies arise, each of which finally acquires cilia and becomes a zoogonidium. During this process of division a rejuvenation of the protoplasm takes place, so that the completed zoospores entirely fill the cell-cavity. At the same time the coloured granular substance, which at first completely fills the spaces between the naked daughter-cells, gradually decreases in quantity until at the time of the liberation of the zoospores it has almost entirely disappeared, though a few scattered granules may in some cases be observed.

This mode of zoogonidia-formation is identical with that described by Klebs for *Scotinosphæra*, and differs from all other methods observed in allied species, except perhaps that described for *C. Facciolaæ* (Borzì), in the secretion of the red pigment. This very characteristic process has never been recorded until the present since it was first described by Klebs in 1881, for though Spencer Moore thought he had found the alga growing in *Lemna trisulca* in 1884, he based his identification entirely on the vegetative characters of the cell since he found no reproductive stages.

The biciliate zoogonidia are extruded through a hole formed by the distintegration of a small part of the zoogonidangium-wall. They are set free separately without any mucous vesicle, and very quickly come to rest without fusing. When first extruded from the mother-cell the zoogonidia are spindle-shaped, with a single chloroplast which is usually posterior in position, but which may form a parietal band round the zoogonidium, leaving a colourless, posterior, pointed apex; a small reddish pigment-spot is frequently to be seen in the anterior colourless part of the zoogonidium. After swimming about for a few moments the zoogonidia become attached by their cilia to one of the blue-green filaments, and by a contraction of the cytoplasm they become pear-shaped, with the chloroplast fitting close against the posterior part of the zoogonidium. Within a few hours the cells completely round themselves off, lose their cilia, and acquire a thin cell-wall; subsequently they develop by gradual stages into ordinary vegetative cells.

IV. CHLOROCHYTRIUM FACCIOLAÆ (Borzì), Bristol.

Since the first description of this alga under the generic name *Centrosphæra* by Borzì* in 1889, it has been recorded by Hänsgirg† from Bohemia and by West ‡ from the south of England, but nothing has been added to Borzì's original description. The alga occurs aggregated in a more or less diffuse stratum among the colonies of various members of the Oscillatoriaceæ. The chloroplast is evidently like that described in this paper for *C. paradoxum*, since Borzì states that the chlorophyll is differentiated into numerous cylindrical rods, some straight and some wavy, winding inwards towards the centre of the cell, where there is a circular colourless area, and accommodating themselves against the inner surface of the cell-wall by their circular base.

Eventually the vegetative cell increases in size, and develops into a zoogonidangium with a much thickened striated wall. This bears 1–3 small conical cellulose projections on its inner surface and a single callous projection on its outer surface. Zoogonidia arise which are set free separately through a small pore formed by the dissolution of some part of the zoogonidangium-wall. The whole of the cell-contents are used in the formation of the zoogonidia, with the exception of the hæmatochrome, which remains in the cell-cavity as a few guttules of red oil. The zoogonidia develop directly, without fusion, into thin-walled vegetative cells, the contents of which on attaining a certain size divide simultaneously to form a number of aplanospores, which are set free by the gradual dissolution of the whole cell-wall. Several generations of aplanospores are produced before the vegetative cells finally develop into zoogonidangia again.

Hansgirg set up a variety (*irregularis*) of this species to include those individuals which he found with the ordinary form, which were rather larger, had a somewhat thicker wall than usual, and were irregular in shape. In view of the instability in the shape of the cells which has recently been shown to exist among these algæ, such a variation cannot logically be considered to justify the setting up of a special variety.

C. FACCIOLAÆ var. MINOR, nob. (*Centrosphæræ* var., Borzì) was considered by Borzì § to be an independent species of the genus *Centrosphæra*. The alga thus described agrees with *C. Facciolaæ* in every particular of its structure and life-history, differing only in the size of its cells. It was found in stagnant deep sea-water associated with other algæ, and can certainly be considered at most only a variety of *C. Facciolaæ*.

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* Borzì. Studi Algologici, Fasc. i. pp. 88–97.

† Hansgirg, Prodr. p. 124.

‡ West, G. S. 'British Freshwater Algæ.' Camb. Biol. Series, p. 199 (1904).

§ Borzì, *loc. cit.*

V. CHLOROCHYTRIUM GRANDE, Bristol.

This species, first described in 1917 *, differs from all the others in its apparently entirely free existence, independent even of blue-green algæ. There is in the cell a single massive central chloroplast somewhat similar to that in *C. paradoxum*, with its surface raised into numerous small rounded lobes, and a large central nucleus.

The life-history of this alga is almost exactly similar to that of *C. Facciolaæ*, but it must be regarded as an independent species on account of the far greater size of its cells, the extensive and very varied thickening of the zoogonidangium-wall, and the extrusion of the zoogonidia through a large vesicle formed by the gelatinization of the inner layers of part of the zoogonidangium-wall.

VI. CHLOROCHYTRIUM LIMNANTHEMUM (D. D. Cunningh.), G. S. West.

This alga, described by Cunningham † as *Stomatochytrium Limnanthemum*, produces yellowish raised spots on the upper surface of the leaves of *Limnanthemum indicum* in India. The young cells are thin-walled and contain a parietal chloroplast filled with granules of starch, and a single nucleus.

By free cell-division the contents of the cell become converted into numerous biciliate zoogonidia, which fuse in pairs to form quadriciliate zygotes which develop into vegetative cells. Those zoogonidia which do not fuse were also observed to develop in exactly the same manner as the zygotes. Cunningham considered that the entry of the endophyte into the host-plant is effected through the stomata by the motile zoogonidia or zygotes, and he definitely states that no germination-tube, such as that observed in *C. Lemnæ* and in other species, is ever produced.

VII. CHLOROCHYTRIUM INCLUSUM, Kjellman (1883).

This species is one of a group of very similar forms, which in my opinion should be regarded merely as variations of a single species; the other members of the group are *Chlorochytrium dermatocolax*, Reinke (1889), and *C. Schmitzii*, Rosenvinge (1894).

C. inclusum was described by Kjellman ‡ from material growing in the thallus of *Sarcophyllis arctica* and of *S. edulis*. The cells are spherical or sub-spherical in the vegetative state, but the alga frequently possesses irregular bulgings, due to the prevention of equal growth by the pressure of the surrounding tissue. The cells are completely imbedded in the nurse-plant; they possess a uniformly thin cell-wall and a thin parietal chromatophore extending over the whole surface.

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* Bristol, B. M. Annals of Botany, vol. xxxi. Jan. 1917.

† Cunningham, D. D. Sci. Mem. Med. Off. Ind., Part III. (1887) pp. 33–40.

‡ Kjellman, F. R. 'Algæ of the Arctic Sea,' p. 320, pl. 31, figs. 8–17 (1883).

With the formation of zoospores the end of the cell next the epidermis of the host becomes a little elongated and bluntly conical; the pointed end penetrates the cortical reticulum of the host, and an ostiole is formed at its apex through which the zoospores are set free into the surrounding water. Kjellman observed that the individuals growing near the centre of the host are usually very much developed, measuring up to 275 μ in diameter, while their walls are striated and uniformly much thickened. He considered that they were probably cells which had entered into a resting state.

In 1898 Freeman*.described an alga which he believed to be a summer state of the same species. Freeman's material was not always completely imbedded in the nurse-plant, and in these cases he frequently observed a considerable thickening and striation of the cell-wall of the endophyte on the outer side. The cells were usually more or less pear-shaped, with the smaller end pointed towards the epidermis of the host, beyond which they never projected more than half the thickness of their cell-wall; they were ovoid, ellipsoid, sphæroid, or in the shape of a figure of eight. They were only occasionally enclosed in the centre of a frond, but in these cases the figures show them to be ellipsoid, with an uniformly thick cell-wall. The cell-wall varied in thickness up to 28 μ on its outer surface and up to 8 μ round the rest of the cell, but it was usually not more than half these dimensions. The chloroplast formed a single yellow-green parietal plate, containing a varying number of conspicuous pyrenoids which were observed to project from the inner surface of the chloroplast into the cavity of the cell. Freeman's figures show in addition that the inner surface of the chloroplast was somewhat uneven, being raised into small projections bearing, in some cases, a pyrenoid at the free end. The production of zoogonidia was never observed in this material, but Freeman considered it to be the same species as that described by Kjellman, since all the differences between the two could be quite satisfactorily attributed to a difference of host-plant and to the difference in the time of year at which the collections were made.

The alga described† under the name *Chlorochytrium Schmitzii*, Rosenvinge (1894), should certainly be considered only as a form of *C. inclusum*, Kjellm., since Rosenvinge's separation of the two species is based entirely on the shape of the cell and the absence of a conical papilla on the outer side of the cell. The basal attenuation supposed to be characteristic of *C. Schmitzii* may be entirely due to the nature of its host—*Cruoria arctica*—especially as both Kjellman and Freeman point out that the inner ends of cells of *C. inclusum* become variously irregular according to the pressure of the surrounding tissues of the host. Again, Freeman definitely states that in his material he found a number of individuals of approximately the same form as that shown in Rosenvinge's figures. No zoospores were observed in this species, hence Rosenvinge's statement that there is no conical papilla on the cells in the vegetative state is of no specific importance, since Kjellman describes the formation of the papilla as a preliminary step in the formation and extrusion of the zoospores. The occurrence of the much thickened wall in Freeman's form seems to be a variation due to position, and must therefore be disregarded in the separation of species.

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* Freeman. Minnesota Bot. Studies, vol. ii. Part III. (1898?).

† Rosenvinge, M. L. K. "Les Algues marines du Groenland." Ann. Sci. Nat., Bot. 7me Sér. xix. (1894) p. 161, fig. 56.

According to Rosenvinge's figures and description the chloroplast is parietal, but does not extend over the whole surface of the cell ; it may contain one or two pyrenoids, or they may be indistinct. This again is an insufficient basis for specific distinction, since Moore * has definitely shown that in *C. Moorei*, N. L. Gardner, the extent of the chloroplast differs according to the degree of development of the cell ; Freeman suggests that the limited extent of the chloroplast may be due to the superficial position of the cell.

CHLOROCHYTRIUM INCLUSUM var. DERMATOCOLAX (Reinke), nob. (1889), is much smaller than the typical form of *C. inclusum*, Kjellm., and is found in the superficial cell-walls of *Polysiphonia elongata* and *Sphacelaria racemosa* †. A form exactly resembling Reinke's, but with rather larger cells, was recorded by Rosenvinge ‡ from *Sphacelaria* and *Chætopteris*, but, unfortunately, neither Reinke nor Rosenvinge has figured the alga he described. The cells are elongated and somewhat flattened, with a fairly thin cell-wall. The chloroplast forms a continuous parietal layer, with ridges projecting towards the inside of the cell ; later the cell-contents become cross-grained and indistinct. In the absence of a figure the extent of these internal projections of the chloroplast is unknown, but if, as seems likely from the description, they do not reach to the centre of the cell, then the chloroplast is seen to be only a further development of that observed by Freeman in *C. inclusum* Kjellm., and there is no need for a separation of the two species on this basis. It is just possible, however, that the chloroplast may be of the type described for *C. Lemnæ* and *C. paradoxum*, and consequently it is perhaps better to regard the alga as a variety of *C. inclusum* under the name *C. inclusum*, Kjellm., var. *dermatocolax* (Reinke), nob., especially in view of its comparatively small size. The formation of zoogonidia takes place in exactly the same way as was described by Kjellman for *C. inclusum*. The zoogonidia bore their way to the inside of the host-wall again, and the hole thus made closes up, so that the alga is completely cut off from the exterior.

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* Moore, G. T. "New or little-known Unicellular Algæ : I. *Chlorocystis Cohnii*." Bot. Gaz. vol. xxx. (1900) p. 100.

† Reinke, J. "Algenflora der westliche Ostsee deutsche Antheils, VI." Ber. Commiss. Untersuch. deutschen Meere in Kiel, 1889.

‡ Rosenvinge. Ann. Sci. Nat., Bot. 7me Sér. xix. (1894) p. 161.

VIII. CHLOROCHYTRIUM SARCOPHYCI (Whitting), G. S. West.

This species, though evidently bearing a very close resemblance to *C. inclusum*, Kjellm., must certainly be regarded as an independent species on account of its destructive action on the fronds of *Sarcophycus*, in which it is an endophyte. The alga causes at first a swelling and loosening of the tissue in which it lives, and finally a complete disintegration of the cells, which may result eventually in the formation of circular holes in the frond.

The cells are described * as uniformly thin-walled, and irregular in shape according to the pressure of the thallus. Spores, 100 or more according to the size of the cell, are produced by free cell-formation; or in some cases the protoplasm is segmented into portions which are of a considerably larger size than the spores, and which, though uniform in size, are irregular in shape. Owing to the fact that only preserved material was examined, the exact nature of these larger segments was not determined, but it was suggested that they might be produced by a preliminary segmentation of the protoplasm before the final formation of the small spores, or that there might be two kinds of spores comparable to those observed in *C. Moorei*, of which these might be the larger.

IX. CHLOROCHYTRIUM COHNII, E. P. Wright.

This species, described first by Wright † in 1877, has been the subject of greater controversy than any other species of the subfamily. Unfortunately, Wright's original description is so full of obvious errors of observation that his description is of little real use in the subsequent identification of his species. He describes the cells as circular in outline, usually imbedded completely in the host except for a small nipple-shaped projection from the surface of the frond. In cases where the cells are developed entirely within the tissues of the host they are destitute of the projection from the cell-wall. The cells contain a single pyrenoid, but Wright's description of the chloroplast is such that it is impossible to understand the nature of the cell-contents. Eventually, by free cell-formation, 10–30 or more zoogonidia are formed, each possessing, according to Wright, a single cilium. The zoogonidia are of two kinds, large and small, and on impinging on the frond, quickly assume a figure-of-eight form, the lower sphere growing into the frond and assuming large dimensions, and the upper portion remaining as a short tubular neck.

Lagerheim's paper on *C. Cohnii*, E. P. Wright ‡, published in 1884, can only be regarded as an amended description of Wright's species, though there are several conspicuous differences between the two. The general characters of the cells exactly correspond to those of Wright's species, but Lagerheim's figures indicate a greater variety in the shape of the cells. There is a single parietal chloroplast which is frequently irregular in shape and contains one conspicuous pyrenoid.

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* Whitting, F., in G. Murray, Phyc. Mem. Part II. p. 43.

† Wright, E. P. "On a new species of parasitic green Alga belonging to the genus *Chlorochytrium* of Cohn." Trans. Roy. Irish Acad. vol. xxvi. p. 355.

‡ Lagerheim, G. "Om *Chlorochytrium Cohnii*, Wright." Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar, 1884, No. 7. Stockholm.

The most important differences between the descriptions of these two forms are that in Wright's form there are two kinds of uniciliate zoogonidia formed by simultaneous division of the mother-cell contents, whereas in Lagerheim's form the zoogonidia are produced by a successive bipartition of the mother-cell contents ; all are small and biciliate, and they fuse in pairs to form quadriciliate zoozygotes. Wright's record of uniciliate zoogonidia of two sizes is certainly the result of incorrect observation, and it is quite possible that the larger kind were zoozygotes formed by the fusion of the smaller zoogonidia, as in Lagerheim's form. Again, it has been directly observed that in *Chlorochytrium grande* division of the cell-contents may take place both by free cell-formation and by successive bipartition, though in both cases the nucleus divides by successive bipartition. It seems, therefore, to be a matter of small importance whether the cytoplasm divides up concurrently with the bipartition of the nucleus, or whether it remains until the divisions of the nucleus are completed, and then rounds itself off simultaneously into as many portions as there are daughter-nuclei in the cell; especially since no cell-walls are formed during the process. It is just possible that the two different methods of division may be induced by varying external conditions, though there is no proof of this ; hence such a difference cannot be considered of specific importance by itself.

In 1885, Reinhardt * found an alga on the shores of the Black Sea, in the tubes of *Coturnarium*, which he considered to be identical with that described by Wright. He described the chloroplast as a lateral plate lying on one side of the cell, containing a single pyrenoid and produced at its edges into a number of radiating arms. Zoogonidia-formation took place by free cell-division in this material. Reinhardt considered that the shape of the chromatophore and the free cell-division were characters of sufficient importance to justify his establishing a new genus *Chlorocystis*, with this species as a basis, differing from *Chlorochytrium* on just these two points, and he renamed the alga *Chlorocystis Cohnii* (E. P. Wright), Reinhardt. Recent work by West and Gardner† has shown that Reinhardt's establishment of this genus was entirely unjustified, and Wright's name has been restored. Gardner, however, does not consider that Wright and Reinhardt were describing the same species, and suggests the establishment of a new species, *Chlorochytrium Reinhardtii*, N. L. Gardner, to include the form described by Reinhardt.

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* Reinhardt, L. 'Contributiones ad morphologiam et systematicam algarum Mari Nigri.' Odessa, 1885.

† Gardner, N. L. Univ. Calif. Publ. in Botany, vol. vi. June 1917.

This course seems to be somewhat unnecessary, since Lagerheim's amended description of the species would certainly seem to support Reinhardt's opinion that the two forms were the same. Unfortunately, Reinhardt's original paper has not been available for reference in this work, and my conclusions have had to be based entirely on second-hand descriptions of the alga; Gardner, however, makes no statement of any definite characters by which the identity of *C. Reinhardtii* could be established, and without such a statement, judging by the evidence at my disposal, his setting up of this new species seems to me to be unjustified.

C. Cohnii, E. P. Wright, var. Porphyræ (Setchell & Gardner), nob. Gardner has also described* what he considers to be a new species of *Chlorochytrium* under the name of *C. Porphyræ*, Setchell & Gardner (1917), but his diagnosis might apply with almost equal accuracy to the form described by Lagerheim in 1884. The cells are spherical, 40–60 μ in diameter, completely imbedded within the host and with no small tubular projection on the cell-wall. Lagerheim's cells were more variable in shape than this, though many globular individuals were found, and they were smaller, not usually exceeding 40 μ in diameter. The absence of a tubular projection cannot be regarded as of specific importance, since Wright has observed that individuals of *C. Cohnii*, Wright, which are embedded completely in the host-plant are similarly destitute of a projection on the cell-wall.

For the rest, Gardner's form contains a single chloroplast, which is at first small and covers only the upper part of the cell, but which later increases in size by sending out several radiating arms, and finally lines the whole cell-wall; it contains a single pyrenoid embedded in the chromatophore towards that part of the cell nearest to the epidermis of the host. Successive bipartition of the contents takes place with the formation of biciliate gametes, all of one size, which escape through an oval aperture in the cell-wall. They fuse in pairs to form quadriciliate zygotes which penetrate into the host-tissues as in Lagerheim's form, except that no part of the germinating zygote remains on the epidermis to make a neck-like projection. The description thus agrees almost exactly with that of Lagerheim, the slight difference in the chloroplast being of negligible importance, while the absence of the tubular neck may be due to a difference of host. It would therefore be best to regard this at most only as a variety of *C. Cohnii*, Wright, differing from it in being completely embedded and in being destitute of a tubular projection on the wall.

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* Univ. Calif. Publ. in Botany, vol. vi. June 1917.

X. CHLOROCHYTRIUM MOOREI, N. L. Gardner.

Among the forms which were attributed to the species *Chlorocystis Cohnii* (E. P. Wright) Reinhardt, was one described by Moore in 1900*. Moore realized that there was not a perfect agreement between the two algæ, but thought that the two were probably forms of the same species. Gardner in 1917 has expressed the opinion that the two forms were not the same, and suggested calling Moore's form *C. Moorei*. If Moore's observations are correct, and his paper gives us no reason to suspect otherwise, Gardner is certainly right in adopting this course, since the distinctions between the two are not of such a kind as would be induced by differences in environment or by individual variation.

The cells were found growing partly embedded in the tubular fronds of *Enteromorpha*, though in a number of cases, even where there was little or no crowding, the cells were entirely epiphytic. The cells are spherical or slightly elliptical, or they may be pear-shaped, with the pointed end embedded between the *Enteromorpha* cells ; they are 16–26 μ in diameter and are never irregularly compressed when crowded. The cell-wall is destitute of a neck-like projection, but in other respects the cells very closely resemble in structure those of *C. Cohnii*.

Quadriciliate zoospores of two sizes are formed by successive bipartition of the contents of the mother-cell ; the larger ones are spherical, with a pyrenoid, and are 6–7 μ in diameter; the smaller are pear-shaped and vary from 2·6–3·5 μ in diameter. The escape of the zoogonidia is effected by the lifting of a circular lid, about 10 μ in diameter, from the surface of the cell. Moore observed that in almost every case the zoospores escaped perfectly freely and independently of one another, but that in a very few instances it appeared as though they might have been enclosed in a delicate membrane as in *C. Lemnæ*. If there were such a membrane it must have been very frail, and was suggested rather by the arrangement of the zoospores than by any actual observation. Moore found that it always seemed to break up before any reagent could be added to demonstrate it, and thought it quite possible that nothing of the kind existed. Gardner's remarks on this point are rather misleading, since he quotes this character as a distinction between *C. Moorei* and *C. Porphyræ*.

No conjugation was observed in any of the physiological states induced in the laboratory, but Moore thought that other physiological conditions might perhaps make it possible.

This form stands as an independent species chiefly on account of its quadriciliate zoogonidia of two sizes, and of the circular lid which lifts from the surface of the cell to set free the zoogonidia. The shape and habit of the cells are also different from those of *C. Cohnii*, though these characters by themselves would have little significance. Moore himself points out that the habit of the plant is variable and that it cannot be regarded as a universal endophyte, while the presence or absence of a colourless tube is of little consequence.

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* Moore, G. T., Bot. Gaz. vol. xxx. (1900) p. 100.

Three other species have been established by Schroeter, but the information given about them is so scanty that it would be practically impossible to identify them again. It is possible that they may belong to certain other species already described, but in the absence of the original paper * it is impossible to determine their affinities.

XI. CHLOROCHYTRIUM LÆTUM, Schroet. (1883).

This species is endophytic in the leaves of *Lychnis Flos-cuculi.*

XII. CHLOROCHYTRIUM VIRIDE, Schroet.

This alga occurs in the leaves of *Rumex obtusifolius* in Silesia, giving a red colour to the epidermis of the host.

XIII. CHLOROCHYTRIUM RUBRUM (Schroet.), Freeman.

The alga grows in the intercellular spaces of the leaves of *Mentha aquatica* and *Peplis Portula*, on which it produces tubercles which are either irregularly globose or ovoid and are often red. It was originally described by Schroeter in 1883 as *Endosphæra rubra*, but Freeman in 1898 transferred it to the genus *Chlorochytrium.*

SUMMARY OF SPECIES BELONGING TO THE GENUS *Chlorochytrium*, Cohn [including *Endosphæra*, Klebs, *Scotinosphæra*, Klebs, *Centrosphæra*, Borzì, *Stomatochytrium*, Cunningham, and *Chlorocystis*, Reinhardt].

I. C. LEMNÆ, Cohn, Beitr. zur Biologie der Pflanzen, i. 2, p. 87, pl. 2, 1875; Kirchner, Die Algen Schlesiens, 1878, p. 102; Klebs, "Beiträge zur Kenntniss niederer Algenformen" in Bot. Zeit. 1881, col. 250, t. 3. f. 1–10; Cohn in Hedwigia, 1882, p. 4; Cooke, Brit. Freshw. Algæ, p. 202, pl. 81. f. 9–11; S. Moore, "Remarks on some endophytic Algæ," Journ. of Bot. xxii. (1884) pp. 136–138; Hansgirg, Prodr. p. 125, f. 72, 1888; Wille, Die Natürlichen Pflanzenfamilien, i. Abt. 2, p. 66, f. 42, 1897.

C. Knyanum, Cohn & Szymanski, "Ueber einige parasitische Algen (Szymanski)," Inaug.-dissert. der Univ. Breslau, 1878; Kny, "Ueber eine grüne parasitische Alge," Sitz. Gesellsch. naturf. Freunde zu Berlin, 1874; Kirchner, Die Algen Schlesiens, p. 102, 1878; Klebs in Bot. Zeit. 1881, col. 255, t. 3. f. 11–15; Hansgirg, Prodr. p. 125, 1888.

C. pallidum, Klebs in Bot. Zeit. 1881, col. 257, t. 3. f. 16 *a–f.*

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* Schroeter, J. "Neue Beiträge zur Algenkunde Schlesiens." 61. Jahresb. Schles. Gesellsch. Vaterl. Cultur, pp. 178–189 (1883).

C. Archerianum, Hieron. in Jahresb. Schles. Gesellsch. Vaterl. Cultur, 1887, p. 296; Bot. Centralblatt. 1888, p. 322; *cfr.* Archer in Quart. Journ. Micr. Sci. vol. xv. p. 120, pl. 7. f. 1.

Cells globose, elliptical or irregular, up to 100 μ in diameter; wall uniformly thick, usually with tubular projection extending to epidermis of host, where it is often terminated by a more or less strongly-developed stopper of cellulose; chloroplast single, consisting of a central axis with radiating branches terminated by flattened parietal plates often fused together, and containing a variable number of pyrenoids. Propagation by successive bipartition of contents into sexual or asexual, biciliate zoogonidia extruded in a mass of mucilage either through the neck or through a hole in the cell-wall. Invasion of host by a germination-tube from zygote or zoogonidium penetrating between epidermal cells and conveying contents of zygote into sub-epidermal tissues.

Hab. In *Lemna trisulca, minor*, and *gibba*, *Ceratophyllum demersum, Elodea canadensis*, and *Sphagnum.*

II. C. BIENNE (Klebs), G. S. West in 'Algæ,' Camb. Bot. Handbooks, vol. i. p. 212, 1916.

Endosphæra biennis, Klebs in Bot. Zeit. 39 Jahrg. no. 17, col. 265, t. 3. f. 17–28, 1881; Hedwigia, 1882, p. 4; Hansgirg, Prodr. p. 125, f. 73, 1888; Frank in Leunis, Syn. Pflanzenk. iii. p. 184; Wille, Die Natürlichen Pflanzenfamilien, i. Abt. 2, p. 66, 1897.

Very similar to *C. Lemnæ*, but tubular projection is absent, cells 60–100 μ in diameter. By successive bipartition the cell divides into a number of daughter-cells each with a cell-wall, and within each of these, by a further bipartition, 8–16 biciliate, sexual zoogonidia are formed; they are extruded without a mucilaginous vesicle and fuse near the opening in the mother-cell wall. Germination as in *C. Lemnæ.*

Hab. In the leaves of aquatic plants—e. g., *Potamogeton lucens* and Graminaceæ.

III. C. PARADOXUM (Klebs), G. S. West in 'Algæ,' Camb. Bot. Handbooks, vol. i. p. 212, 1916.

Scotinosphæra paradoxa, Klebs in Bot. Zeit. 39 Jahrg. no. 19, col. 300, tab. 4; Hedwigia, 1882, p. 5; Frank in Leunis, Syn. Pflanzenk. iii. p. 184; Wille, Die Natürlichen Pflanzenfamilien, i. Abt. 2, p. 66, 1897.

Cells very variable in shape and size, 35–65 μ broad and 50–165 μ long, sometimes larger; cell-wall 2–3·5 μ thick, with usually one or more striated external projections and occasionally one or more small conical internal projections; chloroplast single, often massive, consisting of a central axis containing a very large pyrenoid, and branched radiating arms which do not fuse at the surface; a few small pyrenoids also occur. Propagation by zoogonidia formed by successive bipartition of the green protoplasm, which rounds itself off into a central mass, the rest of the cell-cavity being filled with a red granular substance; zoogonidia asexual, biciliate, spindle-shaped, set free separately through a hole in the zoogonidangium-wall.

Hab. Endophytic in *Lemna trisulca* and *Hypnum* species, or growing in a stratum formed by *Phormidium* species on soil.

IV. C. FACCIOLÆ (Borzì), Bristol [= *Kentrosphæra Facciolaæ*, Borzì, including *Chlorochytrium glœophilum*, Bohlin].

Kentrosphæra Facciolaæ, Borzì, Studi Algologici, Fasc. i. pp. 87–97, tab. 7. f. 1–13 (Messina, 1883); Hansgirg, Prodr. p. 124, f. 71, 1888; Bohlin, K., "Die Algen der ersten Regnell'schen Expedition," Bihang till K. Svenska Vet.-Akad. Handlingar, Bd. 23, Afd. iii. no. 7, 1897, p. 28, tab. 1. f. 53–54; Moore, G. T., Annals of Missouri Bot. Garden, iv. pp. 271–278, Sept. 1917.

Kentrosphæra Fasciolaae, Wille, Natürlichen Pflanzenfamilien, i. Abt. 2, Nachträge, 1909, p. 43, f. 21, A–C;

Vegetative cells globose, shortly ellipsoid or irregular, 26–42 μ broad; cell-wall firm and thin; chloroplast probably as in *C. paradoxum* with a single superficial pyrenoid; hæmatochrome often present. Propagation by aplanospores from vegetative cells, set free by disintegration of cell-wall, or by zoogonidia from cells that have been converted into zoogonidangia, both kinds of spores being produced by free cell-formation. Zoogonidangia up to 80μ in diameter; wall much thickened, with 1–3 small, conical, internal, cellulose projections and a single, large, striated often curved external, callous projection; zoogonidia biciliate, asexual set free separately through a pore in the zoogonidangium-wall. Both kinds of spores develop directly into vegetative cells.

Hab. Among filaments of freshwater Oscillatoriaceæ and of marine *Cladophora*.

VAR. MINOR (Borzì), nob.

Kentrosphæra minor, Borzì, Studi Algologici, Fasc. i. pp. 87–97, tab. 7. f. 14–19; Hansgirg, Prodr. p. 124, 1888.

Structure and life-history as in normal form, but zoogonidangia at most only 10–12 μ broad and up to 35 μ long; zoogonidia few, 8–32 only from one cell.

Hab. In stagnant deep sea-water associated with *Oscillatoria limosa*, *Cladophora fracta*, and *Gongrosira De Baryana*.

V. C. GRANDE, Bristol in Ann. Bot. vol. xxxi. (1917) pp. 107–126, pls. 5 & 6.

Vegetative cells spherical, subspherical, or ellipsoid, 65–75 μ broad; wall firm and thin; chloroplast single, massive, with central axis surrounding the large nucleus and much-branched arms extending to the surface and giving the cell a mulberry-like appearance; a variable number of pyrenoids, starch granules, and oil globules are present. Propagation by simultaneous division into aplanospores or, more rarely, by successive bipartition into zoogonidia. Zoogonidangia very variable in size and form, averaging 130 μ in diameter; wall striated, 6–15 μ thick, with one or two external pectic projections of very variable shape and size and from one to many internal cellulose projections, which are often very large and may branch within the cytoplasm. Zoogonidia asexual, biciliate, oval, or pear-shaped, 3·5–5 μ long, 2 μ broad, extruded separately through a large vesicle in the cell-wall formed by the gelatinization of its inner layers.

Hab. Free-living in a dyke in West Yorkshire.

VI. C. LIMNANTHEMUM (D. D. Cunningh.), G. S. West in 'Brit. Freshw. Algæ,' Camb. Biol. Series, 1904, p. 198.

Stomatochytrium Limnanthemum, D. D. Cunningham, "On an endophytic Alga occurring in the leaves of *Limnanthemum indicum*," Sci. Mem. Med. Officers of Army in India, ed. Sir Benj. Simpson, Part iii. 1887, pp. 33–40; *cfr.* Bot. Centralblatt. xxxvii. (1889) p. 16; Wille, Natürlichen Pflanzenfamilien, i. Abt. 2, p. 66, 1897.

Young cells thin-walled, with parietal chloroplast, numerous starch granules, and single nucleus. Propagation by free cell-division into zoogonidia, which may or may not fuse and are set free separately by a splitting of the zoogonidangium-wall. Entry of host probably through stomata in motile stage, no germination-tube produced. Resting-cells formed containing yellow-green or orange-red pigment; walls thick, warty and brownish on the outside.

Hab. Produces yellowish raised spots on leaves of *Limnanthemum indicum*, India.

VII. C. INCLUSUM, Kjellman in 'Algæ of Arctic Sea,' p. 320, pl. 31. f. 8–17, 1883; Hariot, Algues recuilles par la Mission Scientifique du Cap Horn (Paris, 1882–83); Freeman, "Observations on *Chlorochytrium*," Minnesota Bot. Studies, vol. ii. Part III. 1898 (?).

C. Schmitzii, Rosenvinge, "Les Algues marines du Groenland," Ann. Sci. Nat., Bot. 7^{me} Sér. xix. (1894) p. 169, f. 56.

Vegetative cells spherical, elongated, or club-shaped, often irregular at lower end; either completely embedded in host with uniformly thick wall or slightly projecting with wall thickened at outer surface; length 80–200 μ, breadth 40–100 μ. Cells enclosed in centre of frond much larger, with uniformly much thickened striated walls. Chloroplast single, of variable extent, parietal plate containing a variable number of pyrenoids. Propagation by zoogonidia; outer end of cell elongates, penetrates to epidermis of host and emits zoogonidia through an ostiole at the pointed end of the tube.

Hab. In *Sarcophyllis arctica* and *edulis*, *Gigartina Constantinea*, and *Cruoria arctica*.

VAR. DERMATOCOLAX (Reinke), nob.

C. dermatocolax, Reinke in 'Algenflora der westliche Ostsee deutsche Antheils, vi.,' Ber. Commiss. Untersuch. deutschen Meere (Kiel, 1889); Rosenvinge, "Les Algues marines du Groenland," Ann. Sci. Nat., Bot. 7^me^ Sér, xix. (1894) p. 168.

Cells somewhat flattened, length 20–30 μ, breadth 15–20 μ or a little larger. Chloroplast forming a continuous parietal plate with ridges projecting towards inside of cell. Zoogonidia 4–6 μ long, with posterior, concave chloroplast and brown pigment-spot. Motile zoogonidia bore their way into the host-plant.

Hab. In superficial cell-walls of *Polysiphonia elongata* and *Sphacelaria racemosa.*

VIII. C. SARCOPHYCI (Whitting), G. S. West in 'Algæ,' Camb. Bot. Handbooks, i. p. 212, 1916.

Chlorocystis Sarcophyci, Whitting in G. Murray, Phyc. Mem. Part ii. p. 41, 1893.

Cells thin-walled, 10–40 μ in diameter, irregular in shape. Spores produced by free cell-formation; in other cases the protoplasm is segmented into larger irregular portions, the significance of which was not determined. The endophyte has a destructive action on the host, causing at first a swelling and loosening of the tissues, and finally the complete disintegration of the cells with the consequent formation of holes in the thallus.

Hab. In fronds of *Sarcophycus* on shores of New Holland.

IX. C. COHNII, E. P. Wright, "On a new species of parasitic green Alga belonging to the genus *Chlorochytrium* of Cohn," Trans. Roy. Irish Acad. xxvi. (1879) p. 355; Lagerheim, "Om *Chlorochytrium Cohnii*, Wright," Öfversigt af Kongl. Vetenskaps-Akad. Förhandl. 1884, no. 7.

Chlorocystis Cohnii (E. P. Wright), Reinhardt, 'Contributiones ad morphologiam et systematicam algarum Maris Nigri' (Odessa, 1855); De Toni, Consp. gen. Chloroph. in Notarisia, iii. p. 451; Wille, Natürlichen Pflanzenfamilien, i. Abt 2, p. 66, 1897.

Chlorochytrium Reinhardtii, N. L. Gardner, "New Pacific Coast Marine Algæ, I.," Univ. Calif. Publ. in Bot. vol. vi. no. 14, pp. 381–382, June 1917.

Cells globose, ellipsoid, or slightly irregular, about 40 μ in diameter, embedded in the host, with a small nipple-shaped projection on the surface of the host. Chromatophore forming a more or less irregular parietal plate of variable extent containing a single conspicuous pyrenoid. Propagation by oval zoogonidia formed usually by successive bipartition of the contents of the mother-cell, biciliate with a posterior chloroplast, a single pyrenoid, and a pigment-spot; they are extruded separately through the short neck of the cell, and fuse to form quadriciliate zygotes which in penetrating the host assume a figure-of-eight form, the lower sphere becoming the endophytic cell and the smaller sphere the nipple-shaped projection. Cells in the centre of the host have no projection.

Hab. In *Polysiphonia*, *Schizonema*, *Campanularia flexuosa*, Infusoria, etc.

VAR. PORPHYRÆ (N. L. Gardner), nob.

Chlorochytrium Porphyræ, N. L. Gardner in "New Pacific Coast Marine Algæ, I.," Univ. Calif. Publ. in Bot. vol. vi. June 1917.

Cells spherical, 40–60 μ in diameter, completely embedded in host, without nipple-shaped projection. Chromatophore single, at first small, covering upper part of young cell, then extending by means of radiating bands to cover the whole cell. Zoogonidia sexual, fusiform or almost spherical, 3–4 μ in diameter. In germination of zygote no part remains on epidermis of host.

Hab. In the outer membrane of *Porphyra perforata* and *segregata*, Setchell & Hus.

X. C. MOOREI, N. L. Gardner in "New Pacific Coast Marine Algæ, I.," Univ. Calif. Publ. in Bot. vol. vi. no. 14, p. 382, June 1917.

Chlorocystis Cohnii, G. T. Moore in "New or little known Unicellular Algæ, I.," Bot. Gaz. vol. xxx. (1900) p. 100, pl. 10.

Cells spherical, elliptical, or pear-shaped, 16–26 μ in diameter. Cell-wall uniformly thick and destitute of a neck; chloroplast parietal, completely or partly lining the cell-wall. Propagation by successive bipartition into quadriciliate zoogonidia of two sizes, each with a posterior chloroplast and anterior pigment-spot. Larger zoogonidia spherical, 6–7 μ in diameter, with a pyrenoid; smaller zoogonidia pear-shaped, 2·6–3·5 μ in diameter. Escape of zoogonidia is effected by the lifting of a circular lid 10 μ in diameter from surface of cell, usually without a mucous vesicle; no fusion observed.

Hab. Partly embedded in or wholly epiphytic upon tubular fronds of *Enteromorpha.*

DOUBTFUL FORMS.

XI. C. LÆTUM, Schroeter, 'Neue Beiträge zur Algenkunde Schlesiens' in Jahresber. Schles. Gesellsch. 1883, p. 181.

Cells globose, completely embedded; wall of uniform thickness, destitute of neck. Cell-contents often bright yellow, bright green when submerged. Propagation by "spores" produced by successive bipartition.

Hab. In leaves of *Lychnis Flos-cuculi.*

XII. C. VIRIDE, Schroeter, 'Neue Beiträge zur Algenkunde Schlesiens' in Jahresber. Schles. Gesellsch. 1883, p. 181.

Cells globose, often produced into a short neck; cell-wall uniformly thickened and gelatinous; cell-contents bright green with rounded lobes; a red pigment is present.

Hab. In leaves of *Rumex obtusifolius*, giving a red colour to the epidermis of the host.

XIII. C. RUBRUM (Schroet.), Freeman, "Observations on *Chlorochytrium*," Minnesota Bot. Studies, vol. ii. Part III. 1898 (?).

Endosphæra rubra, Schroet. 'Neue Beiträge zur Algenkunde Schlesiens' in Jahresber. Schles. Gesellsch. 1883, p. 81.

Cells about 90 μ long and 60 μ broad, or smaller; cell-wall 7–10 μ thick, unequally thickened, being often constricted in places, with gelatinous layers, produced into a colourless neck. Cell-contents often red. Sexual zoogonidia are produced. The alga produces irregularly globose or ovoid tubercles that are often red on the leaves of the host-plant.

Hab. In the intercellular spaces of leaves of *Mentha aquatica* and *Peplis Portula*.

In conclusion, I wish to express my thanks to Prof. G. S. West for his suggestion that I should undertake this work, and for his valuable help, especially in the obtaining of literature.

The Botanical Laboratory,
University of Birmingham.

EXPLANATION OF THE PLATES.

PLATE 1.

Representing stained preparations of CHLOROCHYTRIUM LEMNÆ. All figs. ×1435.

Fig. 1. Section of cell embedded in sub-epidermal tissue of *Lemna trisulca*, showing the tubular neck, a central nucleus, a massive radiating chloroplast, and several pyrenoids in the periphery of the chloroplast. (N.B.—Contents shrunk owing to use of reagents.)

Figs. 2 & 3. Sections of fairly typical cells through the nucleus, showing the radiating chloroplast with fused parietal plates containing a number of pyrenoids.

Figs. 4–6. Serial sections of a single typical cell to illustrate the structure of the chloroplast: 4, section through the nucleus, showing small central axis with radiating branched arms and fused parietal expansions; 5, more tangential section with radiating arms cut obliquely; 6, section near periphery, showing the expanded parietal portions of the chloroplast fused together.

Figs. 7 & 8. Radial sections of cells from which the fusion of the parietal expansions of the chloroplast is partly (7) or completely (8) absent.

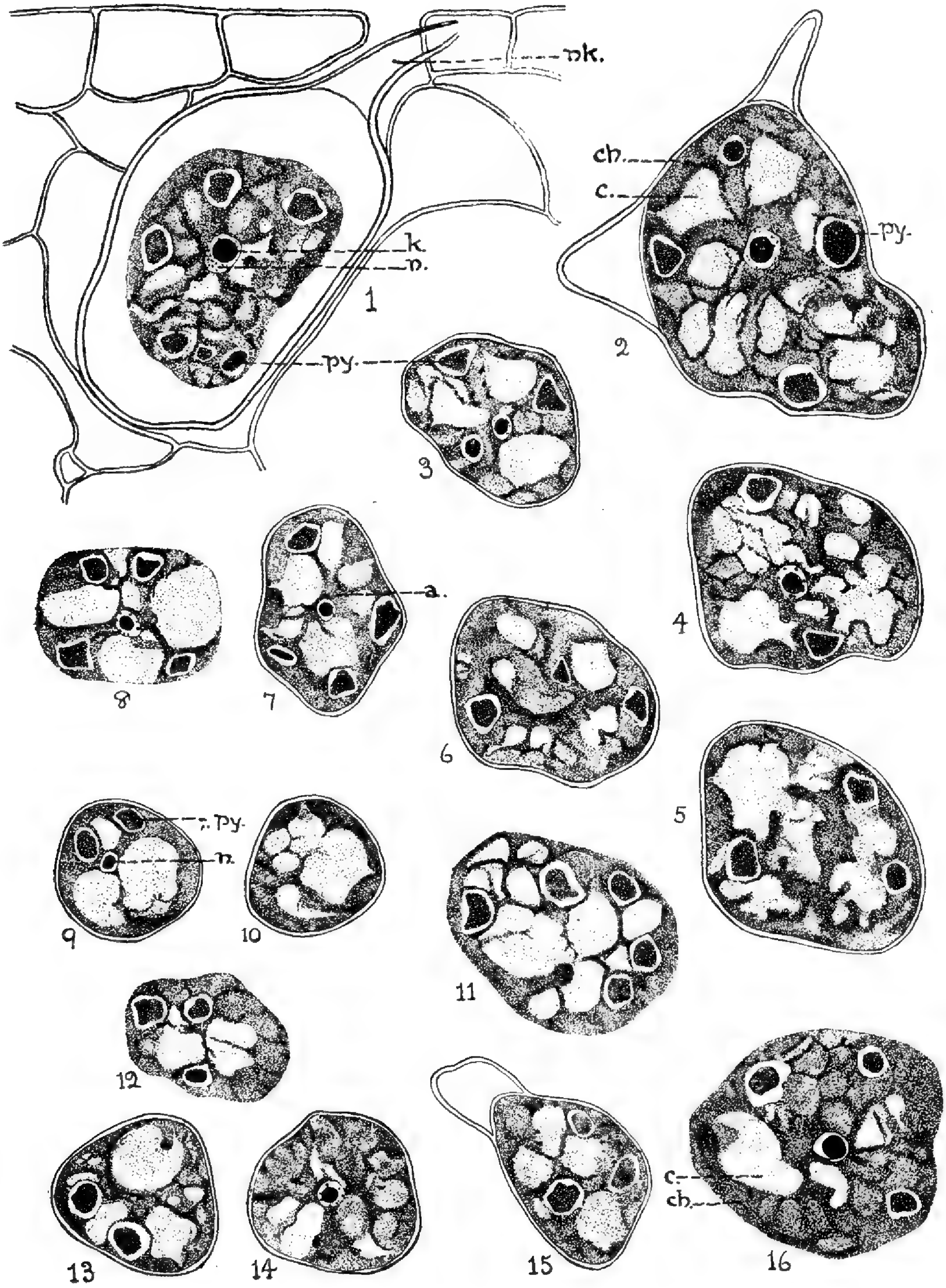
Figs. 9–11. Sections of cells in which the central portion of the chloroplast is much reduced while the peripheral portion is correspondingly developed, giving the appearance almost of a single parietal chloroplast; figs. 9 & 10, radial and tangential sections of the same cell.

Figs. 12–14 & 16. Sections of cells in which there is great development of the axial portion and radiating arms of the chloroplast and the consequent production of a very massive chloroplast. Figs. 12–14, serial sections of the same cell.

Fig. 15. Section of a cell in which one of the pyrenoids is further from the periphery than is usual.

(N.B.—Figs. 8, 11, 12, & 16 are represented without cell-walls.)

c. colourless cytoplasm, *ch.* chloroplast, *k.* karyosome, *n.* nucleus, *nk.* neck, *py.* pyrenoid.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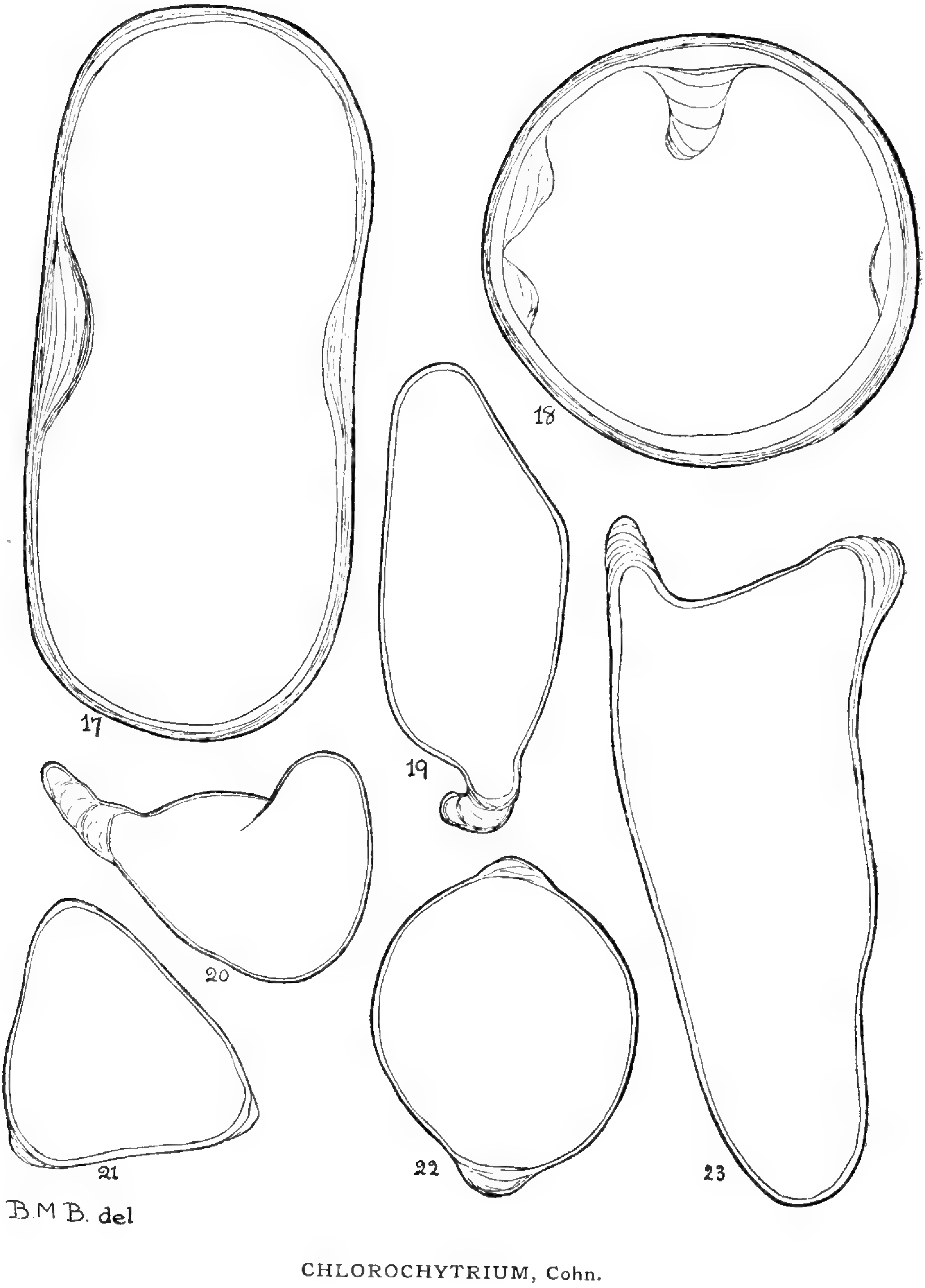
CHLOROCHYTRIUM, Cohn.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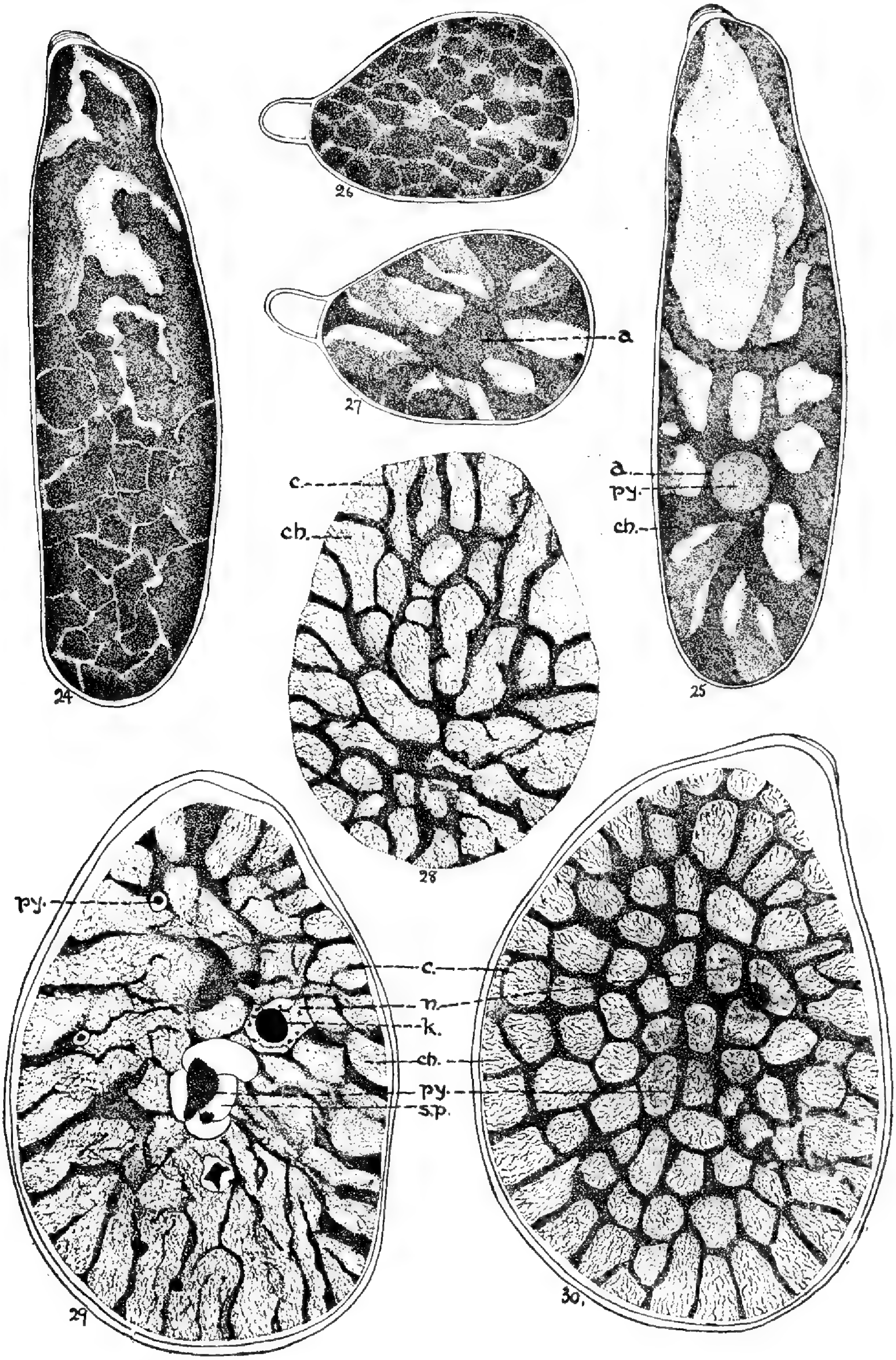
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CHLOROCHYTRIUM, Cohn.

PLATE 2.

Representing the cell-walls of CHLOROCHYTRIUM PARADOXUM. All figs. × 825.

Figs. 17 & 18. Cells with very much thickened walls bearing internal striated projections.

Figs. 19-23. Cells destitute of internal thickenings, showing great variability in form and size of the cell and in the shape and number of the external thickenings.

PLATE 3.

Representing cells of CHLOROCHYTRIUM PARADOXUM ; figs. 24–27 from living material, × 825 ; figs. 28–30 from stained preparations, × 1435.

Fig. 24. Surface view of rapidly growing cell.

Fig. 25. Optical section of the same cell, showing the clear space produced by the large central pyrenoid (*py.*), surrounded by a small axis (*a*) of green protoplasm, from which radiate branched arms with ends expanded against the cell-wall. Owing to extremely rapid growth, the parietal portions of the chloroplast have expanded to form thin irregular plates at one end of the cell.

Fig. 26. Surface view of more slowly grown cell, with apparently numerous, more or less discoid, parietal chloroplasts.

Fig. 27. Optical section of the same cell, showing the central axis (*a*) of the chloroplast with numerous radiating arms, the expanded ends of which are closely pressed against the cell-wall.

Figs. 28–30. Serial sections of a cell stained with Delafield's hæmatoxylin, showing a large central pyrenoid with irregular starch-plates, a nucleus of considerable size containing a large karyosome and a few achromatic granules, and a radiating colourless cytoplasmic reticulum (dark), the meshes of which are occupied by the branched radiating arms of the chloroplast, in which a fine cytoplasmic reticulum can easily be seen. 28, tangential section near surface of cell; 29, middle section through central pyrenoid; 30, surface section showing ends of radiating branches of chloroplast separated by colourless cytoplasmic reticulum.

c. colourless cytoplasm, *ch.* chloroplast, *k.* karyosome, *n.* nucleus, *py.* pyrenoid, *s.p.* starch-plates.

An additional note on a form not originally included in the synopsis.

The alga that has been described as *Chlorochytrium glœophilum*, Bohlin, is probably only a form of *C. Facciolaœ*, Bristol, since the figures and description given by Bohlin, and more recently by Moore, make it quite easy to reconcile the two. The habitat, and the size and form of the cells together with the nature of the cell-wall are quite comparable, while aplanospores are produced and set free in an exactly similar manner in both "species." The absence of zoogonidia in Bohlin's form can be regarded as an effect of environment, and it is possible that under suitable conditions zoogonidia might be produced (cf. *C. grande*). Moore describes the chloroplast as parietal, but his description is based apparently on the external appearance of the cell, whereas a considerable experience with these forms has shown that it is impossible to obtain trustworthy information about their chloroplasts except by means of thin sections. Bohlin's figures, on account of their small size, give little indication of the structure of the chloroplast, but they somewhat resemble on a small scale one of the forms figured for *C. grande*, and are capable of being interpreted in the same way ; and this interpretation is just as likely to be correct as that which Moore has put upon them. Hence the characters on which the separation of the two is based are too doubtful at present to justify the recognition of Bohlin's form as an independent species.

B. M. B.

February 1919.

FRANCIS MASSON
(1741—1805)

Some Early Cape Botanists and Collectors.

By JAMES BRITTEN, F.L.S.

(With Plate **4**; portrait of FRANCIS MASSON.)

[Read 17th January, 1918.]

IN the course of cataloguing the contents of the Sloane Herbarium I have been struck by the number of plants from the Cape collected at an early date which, so far as I am aware, have seldom been consulted. They are practically ignored in the 'Flora Capensis': Mr. Hiern, in his monograph of the Scrophulariaceæ is, I think, the only author who quotes them. This may be explained on the supposition that it was thought impossible to consult them, even if their existence were known; but the index to the Herbarium supplied by Sloane's annotated copy of Ray's 'Historia Plantarum' to a large extent removes any difficulty that such a supposition presents. It may therefore be worth while, in somewhat fuller detail than may be possible in the forthcoming Catalogue, to direct the attention of botanists to the existence of this material, and at the same time to say something about some of the other earlier Cape collections in the Department of Botany, especially of those which were incorporated in the Banksian Herbarium. These latter, although nowadays generally consulted by monographers, have in the past been greatly neglected, and even now do not always receive the attention which they deserve. This remark indeed applies to the Banksian plants as a whole, and in almost equal measure to what are known as the "Solander MSS." although Dryander had almost as great a share in their compilation. These are based on the collections of Sloane and Banks, and, being indexed, can readily be consulted. The Banksian sheets are usually endorsed simply "Promontorium Bonæ Spei" with the name of the collector, and it has been assumed that the locality whence the specimens were derived is not ascertainable; but this is frequently stated in the Solander MSS. and sometimes in the MS. 'Florula Capensis' drawn up by Solander and described by him as "a systematic list of the plants of the Cape of Good Hope, with records of the persons who collected them and notes on the species" (see p. 51).

For a general sketch of the early history of Cape botany, reference should be made to the interesting Presidential Address entitled "Personalia of Botanical Collectors at the Cape" read before the South African Philosophical Society in July, 1886, by the late Peter MacOwan (1830–1909) and published in the 'Transactions' of that Society (vol. iv. pp. xxx–liii; 1887). In the following remarks, as already stated, I have limited myself to the consideration of the earlier botanists and collectors whose work is represented in the Department of Botany of the British Museum.

In the 'Hortus Cliffortianus' (1737) Linnæus establishes the genus *Stapelia*: "Dixi hoc genus a Johanne Bodæo à Stapel laboriosissimo commentatore in Theophrasti opera, cum is facile primus fuerit, qui priorem [the plant subsequently named by Linnæus *S. variegata*] detexit speciem" (p. 77). The compliment was well deserved, but so far as the plant which was the means of conveying it was concerned, the credit for its discovery was due to JUSTUS HEURNIUS, whose drawings, reproduced by Stapel, with the accompanying descriptions, represent the earliest account of Cape plants. It may be worth while to bring together the few scattered notices of this pioneer of South African botany, whose name, by what I take to be an accident, has not been accurately preserved by the genus named by Robert Brown (Mem. Wern. Soc. i. 22) in his honour. The name itself stands (*l. c.*) as *Huernia*; but Brown says "I have named the genus in memory of Justus Heurnius": it seems hardly likely that he intentionally altered the spelling of the name, but it is almost equally strange that he should not have corrected the proof. In the reprint in Brown's collected works (ii. 206) the collector's name is printed "Huernius": it does not occur in Brown's MSS.

The Cape plants figured by Stapel from Heurnius's drawings occupy pp. 334–6 of his edition of Theophrastus (Amsterdam, 1644) and are introduced by the following note:—

"Hoc loco plantas quasdam Indicas describemus, quarum icones, ex India Orientali doctiss. & reverendissimus Pastor ac Medicus Iustus Heurnius, misit fratri Otthoni Heurnio medicinæ Doctori, ejusdem artis, Anatomiæ, & Chirurgiæ Professori in Academia Lugduno-Batava primario, à quo has describendas accepimus. Istis itaque magni Ioannis Heurnii filiis gratis agere de his debent, qui studium botanicum colunt."

J. A. Schultes, in the list of "botanici et collectores" prefixed to his edition (1823) of Thunberg's 'Flora Capensis,' gives a similar account of Heurnius (substituting "Sacerdos" for "Pastor") and adds:—"Numerus quidem plantarum exiguus fuit, cum brevi heic versatus excursiones suas ea tempore vix ultra viciniam montis Tabularis extendere potuisset; sed singulares hujus regionis gazæ non modo rarissimæ fuerunt, sed summam quoque Botanicis Europaeis admirationem excitarunt." From this it appears that Heurnius, as not unfrequently happened and as was the case with Hermann later, visited the Cape on his way to or from India.

Linnæus ('Flora Capensis,' p. 4; 1759: 'Amœn. Acad.' v. 356) thus refers to the collection: "Fuerunt vero hæ: *Canna*, *Kiggelaria africana*, *Hæmanthus coccineus*, *Cotyledon orbiculata*, *Stapelia variegata*, *Aloe Uvaria*, *Oxalides* duæ, quasque Stapelius in Theophrastum 1644 p. 333 edidit et delineavit."

Heurnius must have been a considerable botanist; the descriptions accompanying the figures are evidently based on material which he had supplied, containing as they do full details as to the colour of the flowers, times of flowering, and other details which could only have been communicated by one who had seen the plants growing. Stapel, as he says, had seen nothing but the figures, as it does not appear that Heurnius brought home any specimens. Sprengel adopts his name for what was until then "planta sine nomine"—"Hanc placet *Verbenam lanuginosum Indicam* vocare quæ his verbis ab Heurnio describitur" (=*Manulea rubra*, L.). It seems hardly necessary to explain that "Indica" does not necessarily imply that a plant came from what we now mean by India, as indeed the *Manulea* could not have done: the plants figured by Heurnius (which include a *Hæmanthus* and two Oxalises) are all from the Cape, as indeed often appears in their names. Thus *Stapelia variegata* is described as "Fritillaria crassa promontorii bonæ spei"—a name which Jacquin (following Hermann, 'Cat. Hort. Lugd. Bat.' 54: 1687), who gives a good figure from a specimen cultivated in the Garden, calls "ineptum," though the reference is evidently to the flower "intus fundus luteus maculis fuscis undique conspergitur," which suggested a comparison with *Fritillaria Meleagris*.

Although he was not the first to observe the plants of the Cape, it is to PAUL HERMANN (1640–1698) that we owe our earliest collection of specimens thence. It is common knowledge that among the chief treasures of the Department of Botany is the Herbarium upon which Linnæus based his 'Flora Zeylanica' (1748), and of which he gives some account in his preface to that work (p. 17). Its history and relation to the *Flora* are set forth by Trimen with characteristic care in this Society's Journal (Botany), xxiv. 129–155, but it may be worth while to transcribe textually the manuscript account prefixed by Dryander to the first volume, as this is only summarized by Trimen. The account runs:—

> "This is the Herbarium of Paulus Hermannus, Professor of Botany at Leyden. The plants contained in the three first volumes were collected by him in Ceylon, and those in the fourth volume partly at Ceylon and partly at the Cape of Good Hope. Hermann's Museum Zeylanicum is the catalogue of this collection. Augustus Günther, Apothecary at Copenhagen, sent it 1745 to Linnæus, who from this Herbarium composed his Flora Zeylanica; see his preface to this book.
>
> "Günther either gave it or sold it to Count Adam Gottlob Moltke; see a memoir of Professor Rottböll i det Köbenhavnske Selskabs Skrifter, 10 Deel, page 417.
>
> "After the death of Count Möltke, his library, including this herbarium, was bought by Professor Treschow of Copenhagen, who sold the latter to Sir Joseph Banks for £75."

The purchase by Banks was completed in 1793, as appears from two letters of Banks to Treschow (dated June 14 and July 6 of that year) in the transcript of the Banksian correspondence preserved in the Department. It may be added to Dryander's account that, after the publication of the

'Musæum Zeylanicum,' which was edited by William Sherard from Hermann's notes and plants in 1726, the herbarium was lost sight of for some years. Günther, when he sent it to Linnæus was unaware of its history and value : this appears from the dedication to the former in the 'Flora Zeylanica,' in which Linnæus, identifying it as Hermann's herbarium, writes : "Gratulor orbi erudito, quod hic Thesaurus, qui per 50 annos fuerat suppressus, indignarum manibus versatus, et in Barbarorum hominum scriniis sepultus, rerum vicissitudine iterum emerserit et ab interitu fuerit vindicatus."

It seems somewhat strange that, their existence being known, the Cape plants of this herbarium should have remained practically unnoticed. There is a considerable number of them, for the most part good specimens, many named generically in Linnæus's hand with occasional reference to Burman : two of them, as Trimen points out (*l. c.* 132) are included by mistake in Linnæus's 'Flora Zeylanica,' and, as Cinghalese and Cape plants are mixed up even on the same folios, "it is surprising that [Linnæus] avoided the inclusion of more." The only reference I find to the collection is that by Robert Brown in the preface to his paper on the Proteaceæ in Trans. Linn. Soc. x., where he notes (p. 39) the existence therein of three plants of the order, to which Linnæus had attached names.

In the preface to the 'Flora Zeylanica' (1748) Linnæus gives a biography of Hermann, from which we learn that his early enthusiasm for botany nearly cost him his life. When he was ten years old while collecting plants, he fell into the water and was almost drowned *. Of his visit to the Cape, Linnæus writes : ". . . . in ultimum Africæ Caput B. Spei adscendit ; hanc terram nullus Botanicorum unquam antea calcaverat. O bone Deus quam multæ, quam raræ & quam mirabiles plantæ, uno eodemque die, se Hermanni oculis offerunt. Paucis diebus solus & unicus Hermannus hic plures detegit novas plantas Africanas, quam Botanici omnes, qui umquam in mundo ante eum exstitere." After enumerating the more important plants discovered by Hermann, Linnæus continues : "Inde misit Hermannus in Floræ castra plures novas plantas quam antea ullus, quibus adhuc superbiunt Horti Europæi. Hinc famam sempiternam sibi comparavit summus Inventor." In the preface to his 'Flora Capensis' (1759) Linnæus writes : "Primus fuit Botanicus qui propriis oculis Capitis bonæ spei plantas visitaret, sub itinere in Zeylonam insulam. Collegit hic octingentis (*sic*) circiter plantas, eo tempore plane novas, quarum varia semina et radices in Europam transmisit."

An interesting letter from George London († 1713), successively gardener to Bishop Compton at Fulham, to William and Mary and to Anne, is in

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* "Plantarum amor in tenello cum lacte ita ascenditur, ut puer decennis plantas lecturus in aquis incidens pæne suffocatus fuisset, nisi fata eum ad majores transfretandas aquas destinassent" (p. 11).

Sloane MSS. 4062 f. 214. London visited Holland in 1685 and at Amsterdam "waited on [Hermann] who received me with extraordinary respect and kindness and complemented me soe far as to tell me that his garden should allways be open to me at any time whenever I came and let me command all his plants in y^e garden and then his Hortus Siccus which consists of all y^e dry'd plants of y^e 5 vollms of y^e Hortus Malabaricus. After which he shewed me his collection of seeds w^h are in an excellent method and great varieties of his own collection in y^e East Indies."

In his 'Flora Capensis,' Linnæus, having paid tribute to Hermann in terms already quoted, continues: "Ejusdem messis fuere etiam paucæ illæ quas Th. Bartholinus in actis Haffniensibus vol. ii. p. 57 & 347 memorat." Little is known of THOMAS BARTHOLINUS (1616–1680) beyond the paper here referred to *: it was doubtless to him and not, as Pritzel states, to his son, that Robert Brown dedicated the Cape genus *Bartholina*. His paper seems to have been almost entirely overlooked; it is not included in the "Catalogue of Books and Papers relating to South Africa" (part 1, Botany), by MacOwan and Bolus, published in Trans. S. Afr. Phil. Soc. ii. 111–187 (1882). Its interest as being apparently the first paper devoted exclusively to Cape plants, coupled with its brevity, may justify its reprint: I have added references to the plates which accompany it, and identifications of the species:—

"PLANTÆ NOVÆ AFRICANÆ.

"A. 1673. ex Indiâ Orientali redux Hafniam *Hieremias Stolle* Chirurgus, in medio itinere, in Promontorio nempe bonæ spei, à D. *Paulo Hermanno* Medico, qui alias in Insulæ Ceilon urbe Columba habitat, accepit plantas quasdam ibidem in Capitæ bonæ spei natas, quarum exsiccatarum nobisq; communicatarum hic icones damus, nitidâ *Oligeri Jacobæi* manu, quia alibi descriptas vel depictas non inveni, aliis inquirendi occasionem daturus.

"Eupatorium Indicum fl. albo. [t. 4, f. 3. *Baccharis ivæfolia* L.].
Laurus Africana serrat. foliis. [t. 3, f. 2. *Myrica æthiopica* L.].
Sideritis African. fl. aureo oblongo. [t. 2, f. 1. *Leonotis Leonurus* L.].
Erica African. umbellata flore purpureo. [t. 2, f. 2. *Erica cerinthoides* L.].
Verbena Indica lanuginosa fl. rubente. [t. 4, f. 2. *Manulea rubra* L. f.].
Erica African. arborescens fl. carneo. [t. 1, f. 1. *Erica coccinea* Berg.].
Thymbra Africana fl. purpureo. [t. 1, f. 2. *Muraltia Heisteria* DC.].
Canna Africana minor fl. suaverubente. [t. 3, f. 1. *Gladiolus lucidor* Baker].
Verbena Africana minor fl. luteo. [t. 4, f. 1. *Manulea thyrsiflora* L. f.]."

The list is followed by an enumeration of ten plants of which seeds were brought at the same time; these were planted, and an account of the result was promised, "si quidem cœli nostri sint patientia." Unfortunately this was not the case, for a subsequent note by Bartholinus (p. 347) states that only two of them grew and that not to maturity "sive terræ nostræ, sive cœli culpa." A figure of each is given, "penicillo filii laudati Benedicti adumbratam," but the material is insufficient for determination.

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* He edited the second edition of Gesner's 'De raris . . . . herbis' (Hafn. 1669).

In the same year (1672) and probably at the same time as the plants sent to Bartholinus, which are represented in it, Hermann made the large and important collection, numbering sixty-six folios with an average of three or four specimens on each, which forms vol. lxxv of the Sloane Herbarium*. These were partly named by Solander, who found among them several species then new to science which he described in his MSS. The specimens, a few of which have at some time been removed, are for the most part good, but so far as I am aware no one save Mr. Hiern and the staff of the Department has ever consulted them.

The figure of the first of the plants in Bartholinus's list—*Baccharis ivæfolia*—is referred to by Petiver who names it, after its bringer, "Stoll's Cape Silk-Maudlin," and says it had "been a long standard in Chelsey Garden, where it flowers and seeds yearly about Christmas." He continues: "Mr. Cuningham brought me the first Specimen of this nigh 20 Years since, in his return from the Cape of Good Hope." This was JAMES CUNINGHAME († 1709?), whose collections formed the first important contribution to our knowledge of the plants of China. Cuninghame, from whom numerous letters containing much interesting matter will be found in the Sloane Correspondence, was at the Cape in 1699, whence he sent a few poor specimens to Sloane (H. S. 59. ff. 14–19): others are scattered through Petiver's 'Hortus Siccus Capensis' (H. S. 156), and occasionally have tickets in his hand. Of more interest than these is a list of nine "Plantæ Europeæ ad Bonæ Spei Promontorium spontaneè provenientes," noted by Cuninghame in the same year (Sloane MSS. 2376, f. 1122). The adventive species, judging from synonymy, were *Malva rotundifolia* (and possibly *parviflora*) and *M. crispa*, *Fœniculum vulgare*, *Euphorbia helioscopia*, *Mercurialis annua*, *Urtica urens*, and a *Rumex*: the two others are "Umbilicus Veneris" and "Ros Solis foliis rotundiore: in summitate Montis Tabulari"—the former probably one of the numerous Crassulaceæ, which on general grounds suggested the name to Cuninghame; the latter probably *Drosera cuneifolia*, Thunb. or *D. trinervia*, Spreng., both of which grow on Table Mountain.

"OLDENLANDUS (HENRIC. BERNH.), natione Danus, secundus fuit Botanicus qui ad Caput bonæ spei accessit et plantas ibi conquisivit, cujus herbarium jam possidet cl. Burmannus, Prof. Amstelodamensis" (Linn. Fl. Capensis, p. 4; 1759). In his 'Plantæ Rariores Africanæ' (1760, p. 7)

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* Petiver went to Holland in June 1711 to buy this and other parts of Hermann's collection for Sloane.

Linnæus narrates that Oldenland's and other Cape collections were brought to Upsala for his inspection by the younger Burman, whose 'Floræ Capensis Prodromus,' appended to his 'Flora Indica' (1768), contains many references to Oldenland's herbarium (see also Preface).

In establishing the genus *Oldenlandia**, Plumier writes: "Clarissimus D. Henricus Bernardus Oldenlandius Germanus, Pauli Hermani M. D. et in Academia Lugduno-Batava nuper Medicinæ ac Botanices Professoris Discipulus, Medicinæ ac plantarum studiosus, quarum gratia ad caput bonæ spei se contulit, et paucis ab hinc annis periit vir, meliore fato et longiore vita dignus." Oldenland, however, was a Dane, his death occurred before Aug. 31, 1699—the date of Petiver's reference already cited. We learn from MacOwan that during the governorship of W. A. van der Stell, to whom reference is made later (p. 37), "the Company's garden was in turn, in the charge of Oldenland and Jan Hertog." A Catalogue of the plants collected by them is appended to J. Burman's 'Thesaurus Zeylanicus' (1737), but this "is almost entirely taken from Petrus Kolbe's 'Beschryving van de Kaap de Goede Hoop' (1727), where the author frankly confesses that he got it from Hertog." It would appear from this work as quoted by MacOwan that the credit due to Oldenland and Hertog was appropriated by Van der Stell, and that the latter "was not only robbed of his botanical repute by [him] but suffered at his hands much as Naboth of old did from Ahab." If this estimate of his character be correct, his connection with the volume of Kiggelaer's herbarium (see p. 37) may have been confined to its transmission.

The Sloane Herbarium (vol. clvi, which contains Petiver's "Hortus Siccus Capensis") includes a considerable number of Oldenland's plants, some of them sent to Petiver by Oldenland himself, others by his widow, "Madam Margaretha Hendrina van Otteren," who promised to continue to send him "whatever plants that fertile promontory produces" (Mus. Pet. [p. 46], 1699): it will, however, be seen later that this promise was not fulfilled. Specimens from Oldenland are occasionally met with in other volumes of Herb. Sloane: those in Petiver's volume are in great part named and described in his MSS. by Solander, who there refers to Oldenland many specimens to which no collector's name is attached. Several are named by Petiver himself, who has figured them in Decade 9 of his 'Gazophylacium.'

The last plant in this Decade is named by Petiver "Dolneus his Rock Button-flower," as to which he has the following note:—"This Plant being wholly new both in Face and Species I have determined to record him under the Name of his first Discoverer Dr. Martin Dolneus a German Physician and Surgeon, to whom I am obliged in the Purchase of one greatest part of the Paintings in this Decade, which he procured to be drawn on the Spot from the Original Plants growing luxuriently wild, about that Fertile Promontory the Cape of Good Hope." The volume containing these "paintings"—73 in number, of which 64 are reproduced on tt. 81–89 of the 'Gazophylacium'—is a small quarto which formed no. 88 of the Banksian MSS.; the figures in the "herbal" style, though described by Dryander in the Catalogue of the Banksian Library as "satis rudes," are for the most part identifiable, and represent characteristic Cape genera. They were compared by Petiver with a larger collection of similar "paintings which the States of Amsterdam presented to the Right Reverend the Bishop of London [Henry Compton, 1632–1713], when His Lordship was at the Congress there A.D. 1691," from which some of the figures in Decade 10 were taken.

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* Nov. Pl. Amer. Gen. 42 (1703), in which useful biographies are given of the botanists generically commemorated.

Petiver's 'Hortus Siccus Capensis' contains numerous specimens from other collectors, of most of whom little is known. Among the more important of these is John Starrenburgh (fl. 1700–09), a Dutchman resident at the Cape, who sent Petiver two collections, "amongst which were some very curious and altogether new, gathered near 800 miles up the country" (Mus. Pet. 80). From his letters to Petiver in the Sloane correspondence (Sloane MSS. 4063, 4064) it would appear that he was anxious to improve his position by "serveing other curious gentlemen's natural ingenuity" and to take the position which had been occupied by Oldenland: "it would be a great pity, after the death of Dr. Oldenland," he writes in 1701, "you should be destitute of all collections here to be made: his widow is marryed again to a man who will not trouble his head with these foelerys (as he calls 'em) she being a woman of a covetous temper, who my very good friend Silvanus Landon must sufficiently pay before he could get that remnant of my neighbour Oldenland's collections last brought you." Starrenburgh was well acquainted with Dampier, for whom he had "a particular esteem for his delightful and with me semper agreeing company." Landon (fl. 1679–1701), "a worthy gentleman and most ingenious surgeon" (Mus. Pet. [40], 1699) seems to have been the first naturalist to visit the Azores, whence he brought plants to Petiver in 1679. Drouet (Cat. Fl. Açores) mentions no one earlier than Adanson, who was in Fayal in 1753 and speaks of the abundance there of the shrub (=*Myrica Faya*, Ait.) known locally as Fayal (an equivalent of "beech") from which the island takes its name ('Voyage au Sénégal,' 185).

John Foxe, a surgeon, brought Petiver a collection of Cape plants, one or two of which are noted as from him: the most interesting is a specimen of *Babiana plicata*, Ker (f. 184), a bulb of which was sent to Petiver and was "flowered in Mr. John Tarrants garden at Hoxton" (Mus. Pet. n. 414); specimens from George Stonestreet (fl. 1698), the first collector in the island of Ascension, James Cuninghame already mentioned, Fredrik Ruysch (1638–1731), and Jakob Breyne (1637–97) are also in this volume.

The herbarium of Franz Kiggelaer († 1722) occupies fourteen volumes (ccxiv–ccxxvii) of the Sloane Herbarium, of which ccxiv–ccxviii are almost exclusively Cape plants; these also occur here and there in other volumes. A full description of the contents of the collection will be published in the history of the Sloane Herbarium: some information about it will be found in Richardson's 'Correspondence' (pp. 194, 199), but Sherard's estimate of its importance and extent greatly undervalues it. I do not know how it came into Sloane's possession, nor by whom the plants contained in it were collected. Kiggelaer himself was never at the Cape, nor, indeed so far as we know, out of Holland; one volume (ccxvii) is stated on the title-page to have been sent him by Wilhelm van der Stell, Governor of the Cape, in 1700. This volume is the most interesting of the series; it was apparently collected by Van der Stell himself or by his direction—perhaps by Hertog (see p. 35)—and the plants, many of which are named and described by Solander in his MSS.—as is the case with those in other volumes—are ascribed to him and not to Kiggelaer. The specimens, which are good, are mostly Ericaceæ or plants of like habit; among them are authentic examples of Solander's *Erica margaritacea* (ff. 27, 34), *E. brevifolia* (f. 39), and *E. tubercularis*, Salisb. (*inclyta*, Sol.) (f. 54), and the plant on which Solander founded his genus *Thamnea* (f. 22).

The history of these four plants affords such striking evidence of the unique value of the historical collections in the National Herbarium that I propose to set it forth in some detail.

Thamnea uniflora, Sol. The genus *Thamnea*—"Θάμνος, densus fructibus locus," Solander MS.—based on *Brunia uniflora*, L. Sp. Pl. 199, remained unpublished until it was taken up by A. Brongniart in his "Mémoire sur la famille des Bruniacées" published in Ann. Sci. Nat. 1^{re} Sér. viii. 386 (1826). The name had been incidentally cited among those of other Bruniaceæ by Robert Brown in Abel's Narrative (1818) p. 374; and it was Brown who showed Brongniart the specimens in Herb. Banks which Solander had transferred from Herb. Sloane ccxvii. f. 22, where the bulk still remains. Brongniart names Masson as the collector, but the type, as is shown by the Solander MSS., is from Van der Stell, and it is to this that Solander's name on the Banksian sheet applies; specimens from Masson were added later, and are, in part, *Tittmannia laxa*, Brongn. It does not appear that Brongniart consulted Solander's MS.; his description is not based upon it, and he makes no reference to the Banksian specimens of another plant—*Audouinia capitata*, Brongn. (*Diosma capitata*, Thunb.)—which Solander named and described in MS. and placed in the same genus.

Linnæus based his *Brunia nodiflora* upon the "Brunia floribus solitariis" of the 'Hortus Cliffortianus' (p. 71) and on a plant described and figured by Plukenet (Almagest. p. 136, t. 279, f. 2): the specimens corresponding with both of these are in the National Herbarium. How little the

Banksian Herbarium has been exhausted is shown by the fact that even now new species are described of which the only known material is that collected by Masson a hundred and fifty years ago—an example of this is *Thamnea Massoniana*, Dummer, published in Journ. Bot. 1912, Supp. ii. p. 19; in the same Supplement it is noted that Masson collected *Staavia Dodii*, Bolus, a species first described in 1899 (Ic. Plant. t. 2558). *S. Brownii*, Dummer (op. cit. 28) is based on two specimens collected by Robert Brown at the beginning of the last century, probably in 1801, a date which appears on other of his Cape specimens, and on a cultivated specimen at Kew. Mr. Dummer writes: "A fragment in the British Museum with an appended note stating the height of the species to be 4–5 feet, but without reference as to collector": the "note" is in the hand of R. Brown, who doubtless also collected it. (It is by the way curious that the specific name, by which Mr. Dummer commemorates Mr. N. E. Brown, should also serve to recall the collector of the only wild specimens known of the plant.)

Erica margaritacea, Ait. Hort. Kew. ii. 20. The type of this is in Herb. Banks—specimens from Kew Gardens, 1779, to which it had been introduced by Masson in 1775. A reference to the Solander MSS. shows the undesirability of assigning to their supposed authors individual descriptions in the 'Hortus Kewensis'; in Fl. Cap. (p. 186) the species is ascribed to Solander, but neither name nor diagnosis are his; he described it under another name, which will be found attached to the specimens in Herb. Sloane, ccxvii, ff. 27, 34, clvi, 235 (Oldenland), and cclxi, 11 (Desmarets). The name and the long description (and doubtless also the diagnosis) are in Dryander's hand in the MSS., with a later note (dated "June 90") which indicates that there were two forms of the species and that the description in Hort. Kew. is limited to one of them. The plant written up as *margaritacea* by Dryander in Herb. Banks differs a good deal in appearance from the specimens to which Solander applied the unpublished name subsequently considered identical with it, and with those which are generally accepted as *margaritacea*; but the material is somewhat scanty and the matter had better await a future monographer. Meanwhile it may be noted that on the Banksian sheet are two drawings by F. P. Nodder named *E. margaritacea* and *E. margaritacea β* which seem to represent the two plants. The specimen from Herb. Salisbury mentioned in Fl. Cap. is from the herbarium of Edward Rudge (1763–1846), now incorporated in the National Herbarium; it is labelled *E. obesa*—a name which was substituted by Salisbury (Prodr. 294) for *E. margaritacea*; Salisbury expresses some doubt as to the identity of the two which Dryander had indicated, but later (Linn. Trans. vi. 375) accepts this view. Salisbury's specimen corresponds closely with that named *margaritacea* by Dryander.

Erica brevifolia, Soland. ex Salisb. in Trans. Linn. Soc. vi. 281. The only specimen named by Solander, to whom Salisbury rightly attributes the name, is, as Solander's MS. description shows, that in Herb. Sloane ccxvii, f. 39. The plant, however, upon which Salisbury based his description is that from Masson in Herb. Banks, where is also another sheet from the Cape written up by Salisbury, with a note differentiating *brevifolia* from *calycina* to which Dryander thought it might perhaps be referred. Solander's name was not published, so that the actual types of the species are those to which Salisbury has attached his name.

Erica tubercularis, Salisb. in Trans. Linn. Soc. vi. 330. The specimen from Roxburgh in the Banksian Herbarium is referred to in Fl. Cap., but it is not indicated that this, with another from an old collection (not specified) is the type of Salisbury's species and is so written up by himself. Both in the Herbarium and in Linn. Trans. (*l. c.*) he identifies it with *E. inclyta*, Solander—a name hitherto unpublished, for which in his MSS. Solander substituted another name. Solander's description is based on the specimen sent to Kiggelaer by Van der Stell in Herb. Sloane ccxvii, f. 54.

Little is known of Kiggelaer beyond the note by Linnæus in Hort. Cliffort. (p. 462) when describing the genus *Kiggelaria*: "Dixi arborem in honorem Francisci Kiggelarii, cujus indefesso studio quandam floruit Hortus Beaumontianus; cujus opera tot raræ in Europam ex America delatæ fuere plantæ; cujus industriæ debetur Hortus Beamontianus publici juris factus; cujus notis Commelini hortus Amstelodamensis prior illustratus est." The 'Hortus Beaumontianus' was published anonymously in 1690; it is a catalogue of the garden of Herbert van Beaumont (1641–86) at the Hague, of which Kiggelaer was curator. This was one of the "horti celeberrimi Hollandiæ" which furnished material for Jacob Breyn's 'Prodromus' (1680) wherein reference is often made to the "magnificus et nobilissimus Dominus Herbertus à Beaumont." Dr. Daydon Jackson (Guide Lit. Bot. 440) says that this is "by some attributed to S. H. van Beaumont himself," but in a letter to Petiver (Sloane MSS. 4038, f. 283—not to Sloane, as stated in the 'Index to the Sloane MSS.' 200—Kiggelaer speaks of the work as his. He also contributed notes to Jan Commelin's 'Hortus Medicus Amstelodamensis' (1697) and supplied the "Synonyma Plantarum"—*i. e.* the letterpress—to Munting's 'Phytographia Curiosa' (1713), which shows that he was well acquainted with botanical literature and indeed merits the title "Botanophilus" applied to him on its title-page. A Latin sonnet prefixed to the volume gracefully commemorates his work: here his name is spelt Kiggelaar. The varied contents of his herbarium show that he collected on a fairly large scale and had correspondents in Amboyna and Surinam.

A large volume (cclxi) contains, according to Sloane's note on the title-page, "plants gathered at the Cape of Good Hope and sent to Mons^{r}. DES

Marets, at whose auction in Holland they were bought." It includes numerous, mostly good, specimens, all named by Solander and many described in his MSS. as new. Another volume (ccxci) of plants "gathered at Surinam for Mr. Des Marets" was bought at the same time, from which it would appear that des Marets employed collectors. He was a correspondent of Sloane, to whom he wrote in 1686 asking him to obtain various Jamaica plants (Sloane MSS. 4036, f. 20), and, later, thanking him for seeds. I know nothing more of him.

Another collection corresponding in most particulars with the above, and, like it, bought in Holland at the sale of the owner's belongings, constitutes Herb. Sloane lxxvii. The specimens are good: among Solander's MS. descriptions is a new genus (f. 25) named *Meerseveenia* (= *Eriocephalus racemosus*, L.) after the owner, who is described as "collector plantarum capensium" but concerning whom no information is given. Nor have I any.

Of Franz Pehr Oldenburg, Thunberg gives the following account: "Oldenburgh (*sic*), Suecus*, a memet incitatus et eruditus, in Campis Urbem circumjacentibus comes sæpe meus indefessus Anno 1772 fuit, et eodem anno iter cum D. Masson instituens, plantarum copiam collegit. Anno 1774 insulam Madagascar adiit, ubi febri maligna correptus diem obiit supremum" (Fl. Cap. 1823, x). It appears from Thunberg's 'Travels' (i. 316) that Oldenburg accompanied Masson "partly as his companion, partly as his interpreter" (ii. 133); it was first proposed that the voyage to Madagascar should be undertaken by Thunberg, who recommended Oldenburg, "who had been practising botany for the space of two years that he had accompanied me in my excursions, to go as Surgeon's mate. My recommendation was taken, and Mr. Oldenburg even made several collections of plants, but did not live to return from so unwholesome and scorching a climate."

A MS. note by Robert Brown in Herb. Banks states that he was a private soldier. Banks acquired about a thousand specimens collected at the Cape by Oldenburg in 1772: these are numbered but not named, and were originally mostly on small separate sheets, but are now incorporated in the Herbarium: they are often referred to in the Solander MSS. Lessing named in his honour the handsome South African genus *Oldenburgia*.

Of Andreas Auge (1711–c. 1805) an exceedingly interesting account is given by MacOwan in the paper already referred to. He collected a large herbarium which was ultimately acquired by Burman, but "other sets of exsiccata of smaller extent appear to have been prepared by him for sale or gift to distinguished visitors touching at the Cape on the homeward voyage." It was doubtless from one of these that the numerous specimens from Auge in the Banksian Herbarium were derived. It may be worth while to add to

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* Masson (in Phil. Trans. lxvi. 268) refers to him as a "Dutchman."

MacOwan's account that given by Thunberg, who visited Auge in 1772: he writes:—"Among others I visited M. Auge, the gardener, who has made many, and those very long, excursions into the interior parts of the country, and has collected all the plants and insects, which the late Governor Tulbagh sent to Europe to Linnæus and to the Professors Burmann and Van Royen. And as he still continued his journies yearly into the country, he sold to strangers as well herbals as birds and insects. It was of him that M. Grubb, the director of the bank in Sweden, purchased the fine collection of plants which was afterwards presented to Professor Bergius and is well described by this latter gentleman in his book on the *Plantæ Capenses.* M. Auge's knowledge of botany was not very considerable, nor did his collections in general extend much further than to the great and the beautiful; but, in the meantime, we are almost solely indebted to him for all the discoveries which have been made since the days of Hermannus, Oldenlandus, and Hartogius in this part of Africa" (Travels, i. 105). Thunberg tells us later (p. 183) that Auge acted as his guide in Kaffraria; he mentions (op. cit. ii. 201) an expedition organized by Tulbagh in 1761 in which Auge took part.

The most important of the early collectors represented in the Banksian Herbarium and, so far as I know, almost exclusively there, is **FRANCIS MASSON** (1741–1805), of whom a full account is given in the 'Journal of Botany' for 1884, pp. 114–123. Born at Aberdeen in 1741, he became a gardener, made his way to London, and entered the Royal Gardens at Kew as under-gardener, William Aiton being then at the head of that establishment. At the suggestion of Banks, Masson was sent to the Cape in 1772 to collect seeds and plants for the Gardens: here he remained for two years, returning in 1786 and staying until 1795. During all this period he was an indefatigable collector, both of plants and seeds, as will be seen from the 'Botanical Magazine' and other periodicals where his name is of constant occurrence. He made various journeys into the interior, sometimes accompanied by Thunberg, and sent large collections to Banks; these have until recently attracted comparatively little attention from monographers, but when examined continue to yield new and interesting species: an example of this is *Thamnea Massoniana*, already referred to on p. 37.

It would seem that when in London Masson was in frequent communication with the Banksian Herbarium. The Solander MSS. contain many descriptions, always in the hand of Sigismund Bacstrom—an assistant in Banks's library of whom some account will be found in Journ. Bot. 1911, 92–97,—which must I think have been transcribed from Masson's MSS., as they contain information as to locality which does not appear on the Banksian sheets. That he had a herbarium is clear; whether it was eventually transferred to Banks I do not know, nor could the Lees, who came into possession of Masson's botanical effects, give me any information concerning it [see p. 50].

Occasionally there are in the Solander MSS. notes from Masson of considerable length as well as descriptions taken from his MSS. : that under *Leucodendron conocarpum*, R. Br., may be cited as an example of his careful observation :—

"This tree grows on the skirts of the mountains in hard stony soil and sometimes in sandy and gravelly earth; grows to the height of 8 or 10 feet, with many irregular branches, which spread on all sides, and never aspires, with an upright stem. The leaves are 5-dentated and all over hairy and of a white silvery colour, but shine not as the *P. argentea* [*Leucodendron argenteum*, R. Br.]. They flower in Sept. Octob. and Novemb. The flowers are of a beautiful gold colour collected into a head, but naked without squamæ. The stile is long, a little bent. The flower is burst by the stile, is hairy and curls back. The stile afterwards becomes a down or pappus, which adheres to the seed; the seed is ripe in March; it contains within a hard coat * but comes up plentifully from the seeds which spread themselves sometimes over the adjacent vineyards. It is very plentiful at Constantia. When the fields are set a-fire, and the undershrub and grass are burnt off, the young plants come up plentifully next year. In the time of flowering the trees are plentifully stocked with birds; viz. *Certhia formosa violacea* [*Cinnyris violaceus* (L.)] and a brown sort with a remarkable long tail, where they feed on the nectar of the flowers which they extract with their long arched bills. The people of the Cape Town use it for burn wood which is dug up and carried by their slaves for 5 or 6 miles on a stick about 5 feet long, with a large bundle on each end, which they carry over the shoulders. It would make a fine ornament among the green house plants in Europe, and is to be raised only by seeds, to be managed in the same manner as the *P. argentea*."

It was owing to inquiries instituted with regard to Masson's herbarium that the Department came into possession of a large number of his drawings which, so far as they go, are of almost equal importance with his specimens. A certain number of these drawings were known to have belonged to Banks, and a question as to the whereabouts of these led to the publication of an account of them in Journ. Bot. 1884, pp. 144–148. This in turn led to the presentation to the Department by Mr. Charles Lee, great-grandson of the original James Lee in whose possession they had been, of nearly a hundred drawings, the value of which may be gauged by the fact that Mr. J. G. Baker based upon them descriptions of new species of *Gethyllis* and other monocotyledonous genera described in the Journal referred to in 1885–6. All the drawings are now arranged in one series and form a large folio volume.

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* Space here in MS.

Some doubt has been expressed as to the authorship of the drawings, based on a reference to them by John Bellenden Ker in an unsigned article in the 'Journal of Science and the Arts,' iv. 199 (1818)*. This has already been printed and commented upon in one of the papers already named (Journ. Bot. 1884, 144), but the passage, so far as it relates to the question of their authorship, may be reprinted here :—

"Mr. Francis Masson . . . unexpectedly met with, among the Dutch soldiers who then guarded that colony, an artist of great skill as a designer of the objects of natural history [see p. 49]. Availing himself of the circumstance, he formed a considerable portfolio of coloured drawings of the samples of the more curious objects of his pursuit. . . . They have since been added by Sir Joseph Banks" to his collections.

Whether all the drawings were the work of Masson may possibly be open to doubt: most of them certainly were ; some were taken from plants grown by him and his name is attached to them in his own hand, and there is nothing in their style to differentiate these from the rest.

The three-quarter length portrait here reproduced (Pl. 4) is no doubt that which was at one time in the possession of James Lee : it was bought from a general dealer at Hounslow in 1884 by Mr. Carruthers and was by him presented to the Linnean Society. Masson is shown with a background of cliff : on the left is a view of Table Bay viewed from the north ; Devil's Peak, Table Mountain, and Signal Hill are readily distinguishable ; the artist is unknown.

A contemporary and sometimes a fellow-collector with Masson was CARL PEHR THUNBERG (1743–1828) who, on account of his botanical knowledge and published works as well as for his collections, may be regarded as the most important figure in early Cape botany. A considerable number of his plants are in the Banksian Herbarium, which Thunberg visited in 1778, arriving in London on Dec. 14 of that year. The account of his visit seems worth transcribing :—

"Mr. Dryander, my friend and quondam fellow-student, had very kindly taken upon himself the charge of providing lodgings for me ; my first care therefore was to wait upon this gentleman at the house of Sir Joseph Banks, agreeably to the address he had given me. As soon as I had sent in my name, I was received in the most polite manner by Dr. Solander, who did me the honour to introduce and present me immediately to Sir Joseph Banks, in his Cabinet of Natural History.

"This Gentleman was not only pleased to receive me with the greatest kindness in the present instance, but continued, during the whole time of my abode in London, to show me all possible favour, and, what was the chief object of my wishes, granted me free and uncontrolled access to his incomparable Collections, made (that appertaining to the vegetable kingdom in particular) from every part of the globe. I accordingly spent the forenoon of every day at his house, and went with the utmost attention through his extensive Herbarium, which was a most commodious as well as efficacious method of enlarging my stock of knowledge in this department of my favourite Science. And as at the same time several learned men daily assembled here, as though it were to an Academy of Natural History, I had frequent opportunities likewise of forming connexions that proved as useful to me as they were truly creditable and honourable. . . . Among other favours with which Sir Joseph Banks overwhelmed me, I consider this a singular proof of his friendship that I was permitted, previous to my departure, to view the Collection of Plants made from the islands in the Pacific Ocean, which were not as yet placed among the other plants, and are not shown indiscriminately to every stranger. Dr. Solander, who, as well as Mr. Dryander, strove to render my abode in London both agreeable and advantageous to me, had the goodness, on this occasion, to order the whole of this Collection to be brought down from the upper story, and to go through with me every single and distinct species." He speaks with enthusiasm of Banks's library as "the completest in the world, with respect to Natural History, both in old and new works," and enlarges on the convenience "when one is examining any particular plant, of referring to and consulting whatever author one chuses, without loss of time." (Travels, iv. 288–293 : the quotations are from the third edition, 1796.)

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* This paper and the preceding one seem to have been overlooked by Mr. Bolus when compiling the bibliography prefixed to his "Orchids of the Cape Peninsula" which formed the first part of vol. v. of the 'Transactions of the South African Philosophical Society' (1888).

Thunberg also visited the British Museum, where he inspected Kæmpfer's plants and MSS. in the Sloane collection ; he went to Kew, then under the direction of the elder Aiton, and to the Chelsea Garden and those of Fothergill at Upton (West Ham) and James Lee at Hammersmith. After leaving England he maintained intimate relations with Dryander by means of correspondence ; his letters range in date from 1778 to 1793, with one written in 1803. Besides these letters the Department of Botany possesses two beautifully written MSS. of Thunberg—one, his original description of *Connarus decumbens*, published in Roemer's 'Archiv für die Botanik' (i. 1, 1796), with the original drawing (by Olin): the other (dated "Cap. d. 12 Mart. 1774") a description of a plant which he proposed to name *Solandra* (the *Solandra* of Linnæus having been referred to *Hydrocotyle*) "a Domino Solandro, Medic. Doctore et Botanico per Orbem inclyto." The first (and probably the second) was acquired with Roemer's herbarium, which formed part of the Shuttleworth collection. There is also a holograph letter in French, apparently addressed to Brown, dated from Upsala, 14 March 1822, beginning "Monsieur ! Cher et respectable Ami ! " We have also a manuscript volume in Dryander's hand entitled "Caroli Petri Thunberg . . . Flora

Capensis," which appears to be a transcript of an earlier and unpublished version by Thunberg of his *Prodromus*. Of this transcript we have also a copy by Sigismund Bacstrom, in which Dryander's notes are incorporated and which also contains notes by Salisbury. The history of these volumes cannot be traced ; neither appears in Dryander's Catalogue of the Banksian library. There are also in the Solander MSS. numerous descriptions transcribed by Bacstrom, who was employed by Banks in his herbarium and was to have accompanied him had he gone on Cook's Second Voyage.

Dr. E. D. Clarke in the account of his travels in Scandinavia (Travels, part 3, sect. 2 = vol. vi, 175, 1823) gives a rather pathetic account of his visit to Thunberg at Upsala in November, 1799. He found "the successor of Linnæus in the Botanical chair" delivering a lecture "in the old Botanic Garden, opposite the identical house, or cottage, where Linnæus once resided." The subject was the "'superba *Palmarum* familia' of Linnæus" : "what was our surprise to find the Professor with only half-a-dozen slovenly boys standing around him as his audience—the eldest of whom could not be more than fourteen years of age,—whose whole interest in the lecture seemed to consist in watching for the moment when a palm-branch was cast among them by the Professor, for which they scrambled ; being eager to cut these branches with their knives, for the purpose of making them serve as walking-staves."

JAMES NIVEN (1774 ?–1825) was gardener to George Hibbert, for whom he collected at the Cape (1798–1803) and subsequently for James Lee and others. He made large collections of living and dried plants, especially of Ericaceæ, on which a MS. in his hand is in the Kew Herbarium. Brown in his treatise on the Proteaceæ (Trans. Linn. Soc. x.) dedicated to him the genus *Nivenia*, and acknowledged Hibbert's permission to examine "the valuable herbarium of native specimens" collected by Niven, "and even to dissect such as were new." Salisbury (Trans. Hort. Soc. i. 264) refers to the "useful knowledge relative to the soil and places of growth" of Cape plants which he derived from Niven's manuscript tickets.

Lieutenant (afterwards Colonel) WILLIAM PATERSON (1755–1810) published in 1789 'A Narrative of Four Journeys into the Country of the Hottentots and Caffraria' in 1777–9, which abounds in references to plants : it would seem, indeed, that the journeys were mainly undertaken with a view to observing and collecting them. Thunberg (Fl. Cap. x.) writes : "Paterson, Wilhelm, Anglus, circa 1773 per aliquod tempus, sub sua commoratione, longinquiora suscepit itinera, variaque nova et valde curiosa in patriam suam transmisit." It seems almost certain that he must have had a collection of dried plants, apart from any that he may have sent to England, but of this I can find no trace. He is occasionally mentioned in connection with living plants in the 'Hortus Kewensis'—e. g. *Mesembryanthum compactum* (ii. 191), the introduction of which however is credited to the Countess of Strathmore. During the first of his journeys he was associated with Robert Jacob Gordon, a Dutch colonel to whom reference has been made on p. 43: a further note on him is on p. 49. It seems probable that Paterson was indebted to him for the plates of plants in his 'Narrative.'

Curiously enough, there was at the same period another Patterson, whose reputation was such that it at one time threatened to cause serious hindrance to Masson's work. Thunberg met him at the Cape in 1778: "I met here," he says, "with a Mr. Patterson, an Englishman, who was come to this place in order to collect from the interior of Africa, and transmit home to his own country both the seeds and live roots of such plants as were scarce and peculiar to these parts. He professed to travel at the expense of certain individuals, and possessed some small knowledge of Botany, but was in fact a mere gardener" (Travels, iv. 271). Masson, writing to Banks from the Cape on Jan. 31, 1786, says that he had been advised "how to conduct [himself] as not to excite the jealousy of the inhabitants, which was raised to a great degree on account of Mr. Patterson"; and George Forster (not the well-known botanist) on Jan. 30 of the same year, tells Banks that, although the Dutch Government had permitted Masson to remain at the Cape, "it would seem that his residence here is by no means generally approved of. They say that Mr. Patterson made an ill use of the liberty that was given him, and an ungenerous return of the great kindness that was shewn him, in having accompanied Mr. Johnston in the capacity of a guide. That such conduct was dishonourable, and wholly derogatory to the character he was received in amongst them." Apparently as a consequence of this, Masson wished to go to India, and Forster asks Banks to promote this, but happily Masson remained at the Cape *.

ANTON PANTALEON HOVE (fl. 1785–98) a Kew gardener, was sent to the Guinea Coast in 1785 to obtain plants for the garden, doubtless at the instigation of Banks. Specimens from him are in Herb. Banks—among them types or co-types of interesting species. Of these may be mentioned *Codarium obtusifolium* (=*Dialium guineense*, Willd.) described by Afzelius (Gen. Pl. Guin. 25) from dried specimens—for which, "cum centenis aliis," he was indebted "munificentiæ Illustris Baronetti et Equitis Josephi Banks"—collected by Hove "in loco *Suconda* dicto, juxta promontorium guineense quod *Cabo Corso* appellant Lusitani et *Cape Coarse* dicerent Angli, quod vero ni pro more solito in *Cape Coast* perverterunt." He introduced numerous species of *Pelargonium*: an interesting note on these will be found in Andrews's 'Geraniums,' vol. ii., under *Geranium crassicaule*. A specimen of *Statice rosea* from St. Helena Bay, shows that Hove also collected in the Cape region; this is of interest as being from the locality whence was derived the plant on which Smith (in Rees, Cyclop. xxxiv.) founded the species.

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* See Journ. Bot. 1884, 119–20.

BANKS AND SOLANDER visited the Cape on their return voyage, disembarking on March 14, 1771, and remaining there for a month. For more than half that time Solander was "confined to his bed or chamber," and his illness deprived Banks of the "opportunity of making even one excursion" into the country*. They nevertheless made the most of their opportunities; the MS. Index in Solander's hand, arranged systematically according to Linnæus, contains 369 names. Accompanying the list are full descriptions, subsequently transcribed for publication, of plants of which the names at present received are *Mundtia spinosa*, Kunth, *Gardenia Thunbergia*, L. f., *Acacia horrida*, Willd., *Tetragonia decumbens*, Mill., *Echinopsilon diffusus*, Moq., *Statice peregrina*, Berg., *Tulbaghia acutiloba*, Harv., and a plant, referred in the MS. to *Atriplex* with an unpublished name, which I have not identified. Of these I have found specimens of all save the *Statice* in the herbarium. In the transcribed description of *Gardenia Thunbergia* reference is made to "fig. pict.," which apparently indicates no. 16 of Masson's drawings [see p. 51].

WILLIAM ROXBURGH (1751–1815), whose name is inseparably associated with Indian botany, "resided a twelvemonth" at the Cape, whence he sent plants and seeds to Lambert and also to Banks; the endorsement of one of the Banksian sheets fixes the date as 1799. Many of the species of *Erica* described by Salisbury in Trans. Linn. Soc. vi. are based on the Banksian specimens and are named in Salisbury's hand. In 1868 Dr. R. Alexander Prior presented to the Department of Botany a large number of sheets from his herbarium, among which were many South African plants. These bear printed tickets—"C.B.S., Roxburgh" and are sometimes accompanied by small tickets in Roxburgh's hand. David Don, in his account of Lambert's herbarium appended to that author's 'Pinus,' states that "John Roxburgh resided at the Cape four or five years for the purpose of collecting plants [and] sent a very large collection of specimens" to Lambert. [In Journ. Bot. 1918, pp. 28–34, Sir David Prain gives a full account of John Roxburgh, who "was not the son of one of the three ladies whom William Roxburgh married." He was with his father at the Cape in 1798–9 and remained there till 1804.]

Robert Brown in his monograph of Proteaceæ (Trans. Linn. Soc. vol. x.), acknowledges "the great assistance derived from the extensive collection presented to this Society by Dr. Roxburgh, who during his short residence at the Cape appears to have paid particular attention to this tribe of plants and ... has given a greater value to his herbarium by numerous observations on the sexes, the size, and places of growth, which I have everywhere inserted on his authority." Dr. Jackson informs me that this collection is not now in the Society's possession, having been disposed of at the sale of the Society's collections in 1864.

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* Banks's *Journal*, ed. J. D. Hooker, 429, 437.

JAMES WILES (†1806) was botanist on the voyage of the *Providence* 1791–3, and on his way out collected at the Cape. His plants came to Banks and are in the Herbarium—e. g. *Erica sexfaria* (see under Nelson) endorsed "Cape. Table Mountain, Mr. Wiles. 1791 Nov."

Dr. JAMES LIND (1736–1812) was at the Cape in 1779, on his way to India, and "collected a few plants" for Banks—"more," he writes to him from Cape Town (23rd Oct. 1779), "for the practice of drying them than for anything else, Masson and Paterson having sent home everything this place produces in the vegetable way" (Banks Correspondence, i. 274).

JAMES ROBERTSON, of whom the little that is known is brought together in Journ. Bot. 1899 (p. 87), collected at the Cape in 1772, on his way to India: a considerable number of his specimens, notably in *Restio*,—all endorsed in Bacstrom's hand "C. of Good Hope, False Bay, Mr. Robertson, gathered April 1772"—are scattered through the Herbarium.

DAVID NELSON (†1779) collected at the Cape on Cook's Third Voyage, and his plants, sent to Banks, are in the Herbarium (see Journ. Bot. 1916, 351)—*e. g.* in Ericaceæ, where are specimens of *Erica sexfaria* from Nelson, Wiles, Thunberg, and Masson. These may be regarded as types of that species, which was published first as a plate in Bauer's 'Delineations of Exotick Plants,' t. 11 (1793). Mr. N. E. Brown (Fl. Cap. iv. 1. 240) cites "Bauer" as the authority for the name, on the strength of this plate: the Kew Index gives "Ait."; Bentham (DC. Prodr. vii. 618) cites "Dryand. !"; Andrews (Heaths, ii. t. 131), who first described it, gives no authority. The matter from a bibliographical standpoint is discussed in Journ. Bot. 1901, 107: whatever decision may be arrived at, it is certain, not only from the Herbarium and the Solander MSS. but also from Bauer's original drawing for the plate, that Dryander was the author of the species: Francis Bauer, so far as I am aware, had no knowledge of flowering plants beyond that displayed in his beautiful drawings.

Although ROBERT BROWN lived until beyond the middle of the last century, his visit to the Cape occurred in its first year; and it seems not unfitting that this paper, which has been concerned so largely with the collections in the Department of Botany, should end with a reference to the work of its first Keeper—the 'Botanicorum princeps' of his age.

As is well known, Brown accompanied Flinders on the Voyage of the *Investigator* (1801–3) as "naturalist," with Ferdinand Bauer as "natural-history painter." The ship was at the Cape from Oct. 17 to Nov. 3, 1801, during which period Brown made considerable collections; these formed part of his herbarium, which was acquired by the Department of Botany in 1876. The specimens from the Cape have short descriptive labels attached with dates of collection: a large number are fully described in Brown's MSS. During the earlier part of the voyage, as we learn from his MS. diary, he was largely occupied in the compilation of a Florula Capensis, with a view to his investigations, which began at once: "Oct^r^. 17^th^, 1801. Landed. Walk'd in the neighbourhood of the town; many of the plants I had never before seen: number of heaths, striking Proteas, Mesembryanthema, &c.," is the first entry in the rough journal he kept. We have in the Department a bound volume containing Robert Brown's MS. Journal for 1800 and for June to the beginning of October, 1801. There is also a parcel of memoranda with dates, irregularly kept at intervals from Oct. 1801 to 1804: it is from the latter that this passage is quoted.

One can easily understand Brown's reluctance to leave a region which, as his Journal shows, was so fraught with botanical interest; and Flinders may well have had some difficulty in inducing them to embark. The latter writes (Voyage, i. 31):—"The Cape of Good Hope cannot now be supposed to furnish much of novelty in the department of natural history, especially to transient visitors; but it still continues to afford much amusement and instruction to English botanists. It did so to our gentlemen, who were almost constantly on shore upon the search; and their collections, intended for examination on the next passage, were tolerably ample. They were sufficiently orthodox to walk many miles for the purpose of botanising upon the celebrated Table Mountain; for what disciple of Linnæus could otherwise conscientiously quit the Cape of Good Hope? In taking so early a departure ... I had to engage with the counter wishes of my scientific associates; so much were they delighted to find the richest treasures of the English green house profusely scattered over the sides and summits of these barren hills."

During the voyage Brown wrote out full descriptions of his more interesting discoveries, which included numerous species of *Restio* and *Ehrharta*; many of the latter are represented in the Herbarium (wherein is the type of *E. longifolia*, Sm. Ic. Ined. t. 32) by specimens of his collecting, but I find no Restios. Simon's Bay was the centre whence most of his plants were derived.

Notes to Foregoing.

p. 43:—

This artist was Robert Jacob Gordon (1741–1795), a Dutchman of Scottish extraction, who became Colonel in command of the Dutch forces at the Cape, and is said to have shot himself when the English took the Colony in 1795, in chagrin at the failure of his resistance in arms. He made a large collection of drawings of plants and animals, which was disposed of at the sale of the Stafford Library at Sotheby's in November, 1913, and became the property of the Dutch Government. See Journ. Bot. 1914, 75, 224. The drawing of *Pachypodium namaquanum* in Masson's collection is endorsed by Dryander "copied from a drawing of Captain Gordon's": Masson commemorated him in *Stapelia* (*Hoodia*) *Gordoni*.

p. 42:—

MASSON'S HERBARIUM.—Between 1774 and 1786 Masson established himself near London, perhaps at Kensington, where he resided from 1795 until he went to America in 1797. In Nichols's *Anecdotes* (viii. 620) in the course of a letter to R. Gough, Michael Tyson (1740–80: see Dict. Nat. Biogr. lvii. 499) writes: "Masson himself shewed me . . . his amazing Cape Hot-house, his Hortus Siccus, Ericæ 140 species, Proteæ many, Cliffortiæ more than 50, Gerania, &c. &c." When at Kensington his herbarium was consulted by Correa de Serra, who "examined the Cape Proteas in Masson's collection which has occupied us in these last weeks, and will occupy for some more." He probably disposed of his collections before leaving for America, as Gawler (afterwards Ker) writing in 1808 of *Gethyllis spiralis* (Bot. Mag. t. 1088) says: "Spontaneous specimens, as well as drawings, made by the late Mr. Masson at the Cape of Good Hope of both species, together with several unrecorded ones, are now in the possession of Messrs. Lee and Kennedy, along with the rest of the Herbarium and designs of that indefatigable collector." These were the drawings already referred to as having afforded material for Mr. Baker's descriptions.

In a letter to Smith, dated July 9, 1812, James Lee gives a brief summary of Masson's work—for which he thought "he had been ill paid, considering what he had done for the science of botany"—which seems worth transcribing:

"He explored the Cape of Good Hope twice, Madeira, the Canaries, Azores, Spain, Gibraltar, Tangier, Minorca, Majorca, the West Indies, and Canada. Masson was of a mild temper, persevering in his pursuits even to a great enthusiasm, of great industry, which his specimens and drawings of fish, animals, insects, plants, and views of the countries he passed through, evince; and though he passed a solitary life in distant countries from Society, his love of natural history never forsook him" (Smith, 'Corresp.' 183). Three letters from Masson to the younger Linnæus are in Smith's 'Correspondence of Linnæus,' ii. 559–565; in one of these, dated Aug. 6, 1776, he mentions having sent engravings of two species of *Massonia*, copies of which are in the Department: they were subsequently published in Ait. Hort. Kew. i. (1789).

p. 47 :—

It would seem that the Cape flora had a special attraction for Solander, although his opportunities for becoming personally acquainted with it were so slight. Besides the MS. "Index Plantarum Capensium" mentioned in the text, there are in the Department two others, both excellent examples of the thoroughness of Solander's work. The former, a small quarto entitled "Flora Capensis," is in two parts; the first contains a catalogue of the Cape plants then known, including those collected by Banks and Solander as well as those previously described, with references to the second edition of the 'Species Plantarum' and to other works, and an indication of the species regarded as undescribed. The second MS. (a folio)—the "Florula Capensis" mentioned on p. 29—is of a more ambitious nature; it is a systematic list with indications of the collectors—Banks, Masson, Oldenburg, Auge, Nelson, Thunberg, Robertson, Brande, and the Forsters—and may be regarded as a catalogue of the Cape plants in the Banksian Herbarium, in which however I have not come across specimens from the two last named. The notes on the species, by Solander and Dryander, are often of considerable interest; they include identifications of plants which in the Herbarium bear MS. names, references to Masson's drawings and descriptions, and in many instances definite indications of the localities where the specimens were collected which usefully supplement the "Prom. B. Spei" endorsed on the Herbarium sheets. The "M." and "B." prefixed to the names indicate the presence of the species in the Masson and Banksian herbaria. The attention of workers may be directed to this volume which, so far as I know, is seldom if ever consulted.

March, 1920.

New and Old Species of *Mesembryanthemum*, with critical notes.

By N. E. BROWN, A.L.S.

(PLATES 5–10.)

[Read 6th February, 1919.]

THE object of this paper is twofold in its nature. First to describe some new species of *Mesembryanthemum* that are in cultivation, and in the second place I wish to demonstrate to future monographers the necessity for a thorough revision of the nomenclature of this interesting genus, as in the later monographs of it I have found that there are many errors in identification. In justification of the latter remark it is necessary that I should give the details which follow concerning the history of the genus.

For the bulk of our knowledge of the genus *Mesembryanthemum* we are indebted to Haworth, who between 1794 and 1821 published four monographs of this genus. He was the first to make a systematic classification of its species, and as he described from living plants, chiefly cultivated by himself or at Kew, and had a thorough knowledge of them, he made very few mistakes as to species; and his grouping of them into sections has been followed (apart from a shuffling of their sequence) until the present time. A very large proportion of the known species were described by him; but in many cases his descriptions are inadequate for identification, as they are often only comparisons with other known species, yet they are accurate as far as they go. Fortunately, it happens that a large number of his species are represented in the Kew Herbarium by a series of excellent coloured drawings made from the type plants, so that the majority can be correctly determined. These drawings were made by George Bond and Thomas Duncannon, two skilful artists who were employed at Kew Gardens between 1822 and 1835 to make drawings of the plants cultivated there. The result is that there are now preserved in the Kew Herbarium many hundreds of good coloured drawings of plants belonging to a large number of natural orders cultivated at Kew at that period, some of them being made from type plants of Aiton's 'Hortus Kewensis.' These drawings are all unpublished, and their existence is, I believe, generally unknown. I therefore desire to call the attention of Botanists to them. About a quarter of these drawings represent succulent plants, including very many described by Haworth, and therefore depict his types, the drawing being in many cases all that exists to give us a true conception of what some of his species were like.

As many of the drawings of *Mesembryanthemum* will be found upon comparison with the plant to be coloured too green, it may be well to explain to those who have not cultivated these plants that this may be due to many of the drawings having been made in the early part (January to March) of the year ; for under our dull sunless winter skies much of the white deposit of lime disappears from their tissues during that season, and they often become much greener than in summer time, when it is re-deposited and they resume their more glaucous-green or whitish hue.

Soon after the period when these drawings were being made, the publication of Salm-Dyck's Monograph of *Mesembryanthemum* commenced. This work was issued in seven parts between 1836 and 1863. It is splendidly illustrated and the descriptions of the plants represented are excellent, but unfortunately the names and synonymy attached to the plants figured in many cases do not belong to the species so well figured and so excellently described. This was brought to my notice early in my career when I first came to Kew whilst naming cultivated specimens of *Mesembryanthemum* ; I noticed that some of the species figured by Salm-Dyck were different from the plants bearing the same name that I had been familiar with at Reigate in the rich collection of Mr. W. Wilson Saunders, who had (about 1865 and 1866) over 300 species of *Mesembryanthemum* in cultivation ; some of them, I was informed, were plants that were originally in Haworth's collection and therefore presumably types of his species. This caused me to compare one or two of Salm-Dyck's figures and descriptions with the original descriptions given by Haworth and with the unpublished drawings of the plants at Kew, when it became abundantly evident that mistakes of identification had been made by Salm-Dyck ; and during subsequent years more and more of these wrong identifications were discovered in the same manner. It is well known that plants are often cultivated under wrong names, and the only explanation of Salm-Dyck's misidentifications that seems possible is, that he accepted as correct the name under which the plant was cultivated on the Continent without investigating the authenticity of that name. As a few of these misidentifications are very glaring : it is inexplicable that Berger, who certainly consulted the drawings at Kew, and Sonder, who may or may not have done so, have both failed to detect any of them, but have accepted Salm-Dyck's identifications as being correct, and in several cases have copied from the description given by Salm-Dyck and neglected or ignored the original description given by Haworth, or have combined both, and sometimes added characters derived from dried specimens ; so that it occasionally happens that the name of the species in the monographs of Sonder and of Berger does not belong to the plant described under it, and sometimes the description there given includes characters distinctive of two or more species.

Therefore, finding so much misunderstanding prevalent in books and gardens with regard to many of Haworth's species, it seemed to me desirable to call the attention of any future monographer of the genus *Mesembryanthemum* to the necessity for a thorough revision of the nomenclature of all the species belonging to it, and to point out that this work *can only be effectually accomplished by an investigation of the information stored up in the Kew Herbarium and at the British Museum.* At the latter establishment there are some drawings made by Masson in South Africa representing some of the species he introduced into this country which were described by Aiton and Thunberg, and some others of cultivated plants by Miss Ann Lee and by Simon Taylor, made between 1776 and 1778 *. In the Kew Herbarium are the numerous drawings above mentioned, which represent the types of Haworth's species, and in some cases, as in those of *M. aloides*, Haw., *M. sulcatum*, Haw., *M. cylindricum*, Haw., &c., the drawing represents all that is accurately known of the plant at the present time. As age prevents me from undertaking the task of revising the whole of this enormous genus, which is undoubtedly the largest in South Africa, I deem it advisable to indicate some (not all) of the species I have found to require revision, and have therefore given descriptions of them compiled from translations of Haworth's original descriptions combined with characters omitted by him taken from the drawings at Kew, accompanied by explanatory notes, so as to give a more complete account of these species than has hitherto been published, as well as to correct their synonymy. Also on the plates illustrating this contribution I have copied in black and white a few of the drawings at Kew, or portions of them, in order to show what some of the imperfectly known species described by Haworth are like. For this privilege I am greatly indebted to the President of the Linnean Society, Sir David Prain, who, in his capacity as Director of the Royal Botanic Gardens, Kew, has kindly granted me permission to copy and publish them. Excluding those species of older authors of which it is necessary to change the name and those figured by Salm-Dyck under wrong determinations to which I have given new names, all the new species except four are described or figured from living plants cultivated by myself or at Kew. Many of them belong to that very remarkable section of the genus generally known as the Sphæroid group, and of them no illustration nor English description is given, as these will be added in a future monograph of that group and its allies which I have in preparation; for these plants, owing to their very remarkable character and the small amount of pot-room and attention that they require, are rapidly gaining favour with plant-lovers.

With reference to the nomenclature of cultivated species of *Mesembryanthemum*, I will here point out that it cannot be too widely known that seeds produced upon cultivated plants are likely to generate hybrids unless every care is taken to prevent cross-fertilization with another species. Some of those in cultivation under various names are not typical of the species they are supposed to represent, but are certainly hybrids (of which I have seen many) raised from seeds produced in gardens in Europe or in South Africa, which in some cases have replaced the true species where the latter has died out. As an instance of recent origin, and in years to come one that might not be very liable to detection or suspicion, I may mention that there are plants grown under the names of *M. Bolusii* and *M. simulans* that are neither of them the true species, being hybrids between those two plants. There are also hybrids derived from *M. bilobum* in cultivation that are not at all like the true plant although bearing its name. In the course of time plants raised from their seeds will probably differ more and more, and may possibly at length supplant the original species in gardens, especially as (I am credibly informed) they are gradually becoming extinct in their native habitat. Among other informants, Mr. C. J. Howlett, under the date of March 16, 1918, writes concerning *M. Bolusii* and *M. simulans*, that "They are gradually becoming extinct on account of the severe droughts experienced in the Aberdeen and Graaf Reinet districts, where they often go 20 months without rain, every veldt-bush is dried up and cattle forage about for these succulent Mesembryanthemums. There used to be lots of *M. Bolusii*, but now it is hardly to be found."

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* See Britten: "Notes on *Mesembryanthemum*," Journal of Botany, lv. (1917) pp. 65–74.

Descriptions of species of this genus, with perhaps a few exceptions, cannot properly be made from dried material, for distinctive characters which may be very apparent on living plants often absolutely disappear when the specimens are dried, so that they cannot possibly be correctly identified. Much more attention also needs to be taken with regard to their geographical limitation than has hitherto been the case, for according to my experience and from information I have obtained, the same species rarely has a wide range. Two or more allied species often resemble one another so much, especially when out of flower, that when seen growing in distant localities may easily be mistaken for the same species unless compared side by side when alive, and when dried would in some cases be indistinguishable. Hence I believe the localities given in the 'Flora Capensis' are sometimes open to the suspicion that they belong to more than one species.

The succulent plants of South Africa are more varied in type than those of any other region, and form a conspicuous feature in its very remarkable Flora. To many botanists and horticulturists alike these plants are of very great interest, so that it is a matter of great regret to learn from various South African botanists that many species are in danger of complete extermination by ostriches, who hunt for and greedily devour certain kinds. Numbers of them, so far as known, are very restricted in range; therefore, in a few years' time, unless care is taken to preserve them, some of these remarkable plants may have disappeared for ever. In reference to this, Dr. I. B. Pole Evans, Chief, Division of Botany, Pretoria, in a letter to me dated May 25, 1918, writes as follows:—"I have just returned from a tour through Grahamstown and Port Elizabeth Districts, and what strikes one more than anything else is the rapid change which is being brought about in the vegetation of the country through the introduction of the Ostrich. These birds destroy the majority of the succulent plants, especially Mesembryanthemums, and clear out all the young Aloes. They scour every nook and corner of the veldt, and I think it extremely likely that many succulents which grow in these parts will never be seen again. It is therefore highly desirable that we should make an endeavour to place many more of our interesting South African plants in a spot or collection where they will be safe from the depredations of the Ostrich and Man."

This being the case, it seemed desirable to discover and place upon record the localities (which hitherto have remained unknown) of the species of *Mesembryanthemum* discovered by Burchell when travelling in South Africa over a century ago, so that if they still exist they may be sought for and preserved, and also made known to botanists and horticulturists; for at the present time they are mostly unknown plants, since most of those that were in cultivation have died out, and the descriptions of them in modern works are either imperfect or altogether wrong, from being based upon wrongly named plants. Three of them (*M. arboriforme*, *M. coriarium*, and *M. campestre*) were named by Burchell, who preserved dried specimens of them, of which the types are at Kew. The remainder were described by Haworth from plants raised in England by Burchell from seeds he collected in South Africa and of which he preserved no specimens. Living plants of these were given by Burchell to Haworth, who named and described them, and a set of them was given by Haworth to the Royal Botanic Gardens, Kew, from which coloured drawings were made and are now preserved in the Kew Herbarium. These drawings (as I have already stated) represent all that is definitely known of some of the species, for the figures and descriptions of Salm-Dyck (copied without examination into their authenticity by modern authors) are sometimes wrong, and have no connection whatever with the Burchellian plant. I have therefore carefully gone through all the manuscript lists and notes made by Burchell, which are now at Kew, and extracted from them all the information I could find relating to these species; and as Haworth's works are very rare and difficult to procure, I here give translations of the original descriptions or of all the characters contained in them, in combination with any notes of Burchell's, and details obtained from an examination of the drawings and types at Kew, so as to make our present knowledge of these species as perfect as possible.

Although the genus *Mesembryanthemum* is one of the most extraordinary among flowering plants, yet to the botanist and cultivator alike its chief claim in the scheme of Nature is usually associated with the beauty of its flowers, its other peculiarities being generally unknown or ignored. To the student, however, it offers many points of great interest. For instance, to the best of my knowledge there is no other genus in the Vegetable or Animal Kingdoms in which the evolution of species can be so well demonstrated as by a collection of living plants of *Mesembryanthemum*. I know of no other genus in which a fairly complete series of adult forms can be found in it ranging from those which, except in size, scarcely differ in form from the cotyledonary stage, into other vegetative types, such as bushes and plants with long trailing stems that are utterly different from the cotyledonary or embryonic form. And even if it were claimed that some of the groups into which this genus is at present divided really represent distinct genera, it would not affect the obvious chain of evolution in any way. It is not my intention to deal with this point now, but I hope to do so on another occasion.

A point of interest that I do not remember to have seen mentioned by previous authors is the manner in which the leaves of some of the species of this remarkable genus, which only produce 2–4 leaves on each growth in a year, vary in form and size at different periods, sometimes in such a marked degree that the same individual seen at one season might easily be thought to be a different species when seen at another time of the year, by reason of the two pairs of leaves which form the season's growth being more or less dissimilar. This feature is most evident perhaps in the sections *Marcida*, *Moniliformia*, and *Rostrata*. When a plant commences to make its new growth at first only one kind of leaf is seen, then when the second pair is produced they are often more or less unlike the first pair, so that two forms of leaf may be seen upon the same growth. A typical example of this is represented by *M. candidissimum* on Pl. **7.** figs. 25, 26. Finally, when the older pair has withered or fallen away, only one type of leaf will be noticed, which in the case of the *Marcida* and *Moniliformia* groups will be the pairs that form the cones.

Variation in size is probably due to the varying amount of moisture and food the plant obtains; for not only does a little more water in the soil or atmosphere induce increase of size, and may even cause the leaves to crack or burst open, but I have also found that a change of soil will sometimes bring about a similar result. This is well demonstrated by the two figures of *M. proximum* on Pl. **5**. Fig. 3 represents a branch with a cluster of three growths upon it cut from a plant and rooted in the autumn of 1917. In May 1918 it was repotted into a different soil, and at that time was very little larger than represented by fig. 3; but by October of that year all the cones had very greatly increased in size, fig. 4 representing in outline one of the largest a week before it commenced to burst and display its component pair of leaves as described below. Yet in spite of the increase in size I believe it had less water than the plant from which the branch was cut and which did not make larger cones than those represented by fig. 3.

Another point of interest is the mode of growth of the *Sphæroidea*, *Monili-*

formia, and allied sections. These plants constitute collectively a group that is absolutely distinct from all other flowering plants both in appearance and manner of growth, for the way in which the new growth bursts through the skin of the old one more nearly resembles the changing of the skin among insects than anything else I can liken it to. No other plants do this. As an example of this curious mode of growth, I will illustrate it by describing what takes place in *M. dissitum*, N. E. Br., and its allies. On Pl. **5**. fig. 9 is represented a branch as it appears when the season's growth is completed in late spring. It is seen to terminate in a fleshy cone bearing two short leaves at its apex, and is supported upon a long internode of stem arising from a pair of longer leaves with a smaller cone in each axil. At this period the cone and leaves are green and remain so for a time, then the two long spreading leaves and the short ones at the tip of the cone wither and dry up, and the green skin of the cone gradually assumes a greyish or pale brownish colour, and the plant then presents a somewhat dead or dying appearance, its leaves being dried up. In late autumn each cone bursts, revealing a fresh pair of long spreading leaves, free to their base, where they are connate around the stem, and bearing upon them the fragmentary remains of the ruptured dried-up skin of the old cone. A few days afterwards there emerges from between them at their base the early stage of a new cone-like growth as I have represented on Pl. **6**. fig. 11. At first the young cone is cylindric and almost indistinguishable from the internode below it, as is shown in this figure ; afterwards it enlarges and assumes its characteristic cone-like form. The cone is really formed by a pair of leaves being united for the greater part of their length into an apparently solid mass, the tips only being free and spreading. In the centre of the base of the cone a bud forms that gradually develops a pair of leaves that are not united, but have their upper surfaces closely applied to one another. They gradually enlarge within the cone at the expense of the nutriment contained in the latter, so that as the nourishment is gradually absorbed the substance of the cone is gradually being replaced by the new pair of free leaves, which ultimately completely fill the skin of the old cone without materially altering its shape, although in autumn they may greatly increase its size. These changes go on unseen (and, until studied, unsuspected) within the interior of each cone, and until the old dry skin is burst there is no visible evidence that anything of the kind has taken place, any more than there is evidence that a caterpillar is gradually developing a new skin inside the one that is visible.

The flowers also offer some points of interest, such as their response to light, susceptibility to temperature, and daily increase in size after their first expansion. With reference to their fertilization, so far as I have observed in the Sphæroid group, many or possibly most of the species seem infertile to their own pollen, and yet when I have examined the stigmas of various species under a microscope I have always found them to be plentifully covered with pollen emitting pollen-tubes, some of which can be distinctly traced penetrating the tissue of the stigmas. Yet in no case have the plants produced capsules or seeds. I do not know if this is a new observation, but I do not happen to have seen it recorded. Where, however, I have happened to have two distinct plants (*i. e.*, raised from two separate seeds) of the same species in flower at the same time, and have cross-fertilized them, the formation of fruit readily followed. I believe hybridization is also very common in this genus. It certainly occurs among species cultivated in this country, so that I see no reason why it should not occur in South Africa, although Dr. Marloth, a keen observer of South African plants growing under natural conditions, holds a different opinion I believe, see his Address to the South African Association for the Advancement of Science, given at Kimberley in 1914, p. 20, published in the 'South African Journal of Science' for that year.

As I herein propose to make some changes in the groups or sections to which the species here described are referred, an explanation is necessary. As previously stated, most of the new species belong to what is universally known as the Sphæroid group. But this group, as constituted in the most recent monograph of the genus (Berger, 'Mesembryanthemen und Portulacaceen,' p. 280), contains plants belonging to three distinct types, and in the older monographs, later than the works of Haworth, two distinct types, of which the majority do not belong to the Sphæroid group at all, in the sense that Haworth intended when he founded that section, but to the group to which he gave the sectional name of *Minima*. The section *Sphæroidea* was founded by Haworth in 1821 ('Revisiones Plantarum Succulentarum,' p. 84) upon *M. nuciforme*, Haw., which until 1907 remained the only known species that properly belonged to that section as defined by Haworth. Yet all other authors seem to have misunderstood *M. nuciforme* and failed to recognise its characteristics, so that a few years ago it was re-described by Miss Kensit under the name of *M. cryptopodium*. This plant is allied to *M. Elishæ*, N. E. Br., *M. quæsitum*, N. E. Br., and allied species, one of which (*M. bilobum*, Marl.) has been erected by Berger into a distinct section (*Cordiformia*) by itself; whilst *M. nuciforme*, which is only a dwarfer, more spherical, and more shortly bilobed plant of the same type, is included among the species of the *Minimum* type under the section *Sphæroidea*. *M. nuciforme* died out of cultivation, and no other species of that type became known until a few years ago, so that from some mistaken conception of it the sectional names *Minima* and *Sphæroidea* were lumped together and that of *Sphæroidea* adopted to cover both types, but in practice it was really understood to include only the *Minimum* type. Therefore, as the plants originally grouped by Haworth under the sectional name of *Minima* are now universally known as the Sphæroid group, I propose that the name *Minima* for this group be abolished and the name *Sphæroidea*, by which it is now so well known, be maintained for it, as that name applies to the plants now understood as belonging to that group very much better than it does to the plants which, according to Haworth's definition of the section as given under the description of *M. nuciforme*, would otherwise be included under it, most of these being by no means sphæroidal in shape; so that the term *Sphæroidea* would be quite unfitting if restored to *M. nuciforme* and its allies, which are all well characterised by the top of the growth being distinctly notched or 2-lobed and often more or less compressed or keeled there, as if pinched between the finger and thumb. I therefore propose the sectional name *Biloba* for those plants having this type of structure, which will include *M. nuciforme*, Haw., *M. quæsitum*, N. E. Br., *M. Elishæ*, N. E. Br., *M. bilobum*, Marl., and all allied species.

The species belonging to the Sphæroid group are, apart from their shape, all well characterised by the presence in their adult condition of a small central orifice at the top, through which the flower issues. In recent years, however, a few species have been discovered which, although conforming to the Sphæroid type in general shape and also in having a central orifice in the juvenile stages, yet in the adult stage differ by having a fissure extending transversely entirely across the top, and the flowers are also of an entirely different type, the corolla being quite destitute of a tube. These plants I propose to erect into a separate group under the sectional name of *Fissurata*, or the Fissured group, which will include such species as *M. turbiniforme*, Haw., *M. pseudotruncatellum*, Berger, *M. Lesliei*, N. E. Br., and their allies. The fissure across the top gives evidence that the single body of which the growths apparently consist in the Sphæroid group is in reality composed of a pair of opposed leaves completely united, except along a narrow part from base to apex corresponding to the position of the midrib, so as to form a flattened tube down the centre of the fleshy body, the terminal opening of which forms a central orifice to the plant, through which the flower issues. In the sections *Biloba* and *Fissurata* the first stages of the separation of the two leaves of which the body is composed give an indication of the manner in which these plants began to evolve from the simple Sphæroid type through various stemless types into bushy and trailing types.

I am inclined to think that some of these plants should be separated generically from *Mesembryanthemum*, and am investigating certain characters with this end in view. For the present, however, I retain them as sections of *Mesembryanthemum*, and give a diagnostic key to the groups into which the plants now cultivated under the name of "Sphæroids" should be divided, and have included in it the sections *Moniliformia* and *Marcida*, the six groups in this key being perhaps the most remarkable in the genus :—

* Plant very dwarf, tufted or occasionally solitary, stemless or rarely developing forked stems that in nature become buried in the ground. Each growth (really a branch or offset) an apparently solid entire or 2-lobed fleshy body.

  † Adult flowering growths with a small orifice like a closed mouth at the centre of the top or in the base of the notch between the lobes. Petals united at their lower part into a tube.

    Growths obconic, obcordate, obovate, globose or rarely somewhat clavate, usually entire, with the top convex, flat or depressed, or, if somewhat 2-lobed then with the lobes rounded and not as if pinched into a ridge at the top nor flat on their inner face at the notch ...... Sphæroidea.

    Growths usually oblong, sometimes obovoid or subglobose, notched or distinctly 2-lobed at the top, which is often as if pinched between the thumb and finger into a ridge or keel, with the inner lobes of the face flat at the notch .... Biloba.

    Growths divided part of the way down into two cylindric or turret-like lobes .... Turrita.

  †† Adult flowering growths or plant obconic or cylindric, with a transverse fissure all across the top dividing it into two very short convex or flat lobes. Juvenile plants have only a small central orifice. Petals widely spreading and free from the base, not forming a tube .... Fissurata.

** Plant with distinct erect stems branching above ground or very dwarf and tufted. Each branch or branchlet producing annually one pair of leaves that are free to their base and spread widely or recurve, and a second pair that are united for the greater or lesser part of their length into a globose, cylindric, or conical body which persists, whilst its free-spreading or erect tooth-like tips and the free leaves shrivel and sometimes fall away.

  Shrublets or with clustered stems 5–30 cm. high, branching; young leaves papillate, not conspicuously gland-dotted .. Moniliformia.

  Very dwarf tufted plants 2–3 cm. high; young leaves smooth, not papillate, conspicuously pellucid-dotted when held against the light .... Marcida.

The genus *Mesembryanthemum*, like *Euphorbia*, whilst remarkably uniform in the appearance and structure of the flowers of its various species, contains a large number of perfectly distinct vegetative types, around each of which several allied species can be grouped; and these groups have by authors been formed into characterised sections, which, however, more or less graduate into one another, so that they cannot always be rigidly defined by words. Therefore, although averse to the formation of sections where all are bound together by the threads of evolution into one coherent whole, I have arranged the species here dealt with under the sections already characterised, and have made new sections for the few species that cannot well be placed in any existing section.

With the exception of those discovered by Burchell, I have arranged the species alphabetically under each section and maintained the sectional name given to each group by Haworth, which is not always the same as that used by Sonder and by Berger. As no satisfactory arrangement of the sections exists, for convenience of reference I have here arranged the sections alphabetically under two primary headings according to whether the species have an erect or prostrate stem with distant leaf-pairs, or are quite stemless or with crowded leaves on very short more or less decumbent stems. The species discovered by Burchell are all placed together at the end in alphabetical order, with the section to which they belong indicated under the name.

Under the Sphæroid and allied groups the term "growths" or "corpuscula" are used to indicate the separate bodies, heads, or offsets into which the plant may be divided. In reality they are all separate branches, but often do not have that appearance.

A Bibliography and abbreviations will be found on p. 138 at the end of the descriptions.

In conclusion, I have much pleasure in gratefully acknowledging the very efficient help I have received from Mrs. L. Bolus, Mr. J. Burtt Davy, Mr. W. J. Doree, Mr. G. Elisha, Dr. F. H. Rodier Heath, the authorities at Kew, Dr. R. Marloth, Messrs. Eustace and N. S. Pillans, Dr. I. B. Pole Evans, and Mr. E. Taylor, to whom I offer my very sincere thanks for the material and information they have so freely accorded, which has enabled me to make the following descriptions much more complete than they otherwise would be.

I.—Stemless, or if with very dwarf branching stems then without distinct intervals of stem (internodes) between the leaf-pairs. (To p. 103.)

§ ACUTA.

M. DIMINUTUM, *Haw.* (Pl. 7. fig. 24). Nearly stemless, branching at the base and forming a tuft. Leaves crowded, equal, ascending or suberect, finally recurving (according to the figure about 3 cm. long, 4 mm. broad, and 3½–4 mm. thick at the base), linear-subulate or semicylindric at the base and obsoletely triquetrous at the apex, shortly united at the base, flat above and gradually tapering from the base to a very acute apex, which is furnished with a short white point, soft; surface smooth, shining, glaucous-green, dotted, but not roughly so, and with numerous moderate-sized dots on the upper surface when held to the light. Peduncle about 3 inches (7½ cm.) long, cylindric, glabrous, with 2 bracts at its base. Calyx 5-lobed; lobes unequal, acute, the 2 larger leaf-like, the 3 smaller with more or less membranous margins. Petals about an inch (25 mm.) long, linear, obtuse, at length revolute, reddish. Stamens numerous, erect; filaments purplish;

anthers whitish. Styles 9, greenish, spreading.—*M. diminutum*, Haw. Misc. p. 26; Synop. p. 230; and Rev. p. 107: Ait. Hort. Kew, ed. 2, vol. 3, p. 214. *M. diminutum* var. *pallidum*, Haw. Suppl. p. 99. *M. corniculatum*, Haw. Obs. p. 226, not of Linnæus.

SOUTH AFRICA. Locality and collector unknown. In cultivation before 1789 according to Aiton.

The variety *pallidum* was described by Haworth from a plant cultivated at Kew, as having softer, paler, smoother, and shorter leaves than the type, but in his 'Revisones,' p. 107 he states that it was merely an imperfect plant of *M. diminutum*; from which I should understand that when he described it as var. *pallidum* it was a plant that had got out of condition, and that afterwards it resumed its normal character. Possibly the original drawing at Kew, which I have copied on Pl. 7, was made from that particular plant.

Haworth (Rev. p. 107) also places *M. cauliculatum*, Haw. Suppl. p. 90, as a variety of *M. diminutum*, from which he states that it differs in being about twice as large.

§ ALBINOTA.

M. CIBDELUM, *N. E. Br.* I propose this name for the plant figured by Salm-Dyck under the erroneous name of *M. aloides*, Haw. and accepted by subsequent authors as being that species, from which it is totally different and is, beyond doubt, the same as the plant described by Haworth as *M. albipunctum* var. *majus*, of which (as well as of typical *M. albipunctum*, Haw.) there is an original coloured drawing at Kew. But it is also certainly distinct from typical *M. albipunctum*, Haw., for its leaves are twice as long and about twice as broad and somewhat different in shape, and the flowers (which Haworth apparently had not seen) have only about half as many petals, which are also much broader and less acute than those of *M. albipunctum*.

M. cibdelum differs from *M. aloides* besides in the very different form and pose of the leaves, by the stamens being erect in a cylindric mass and not forming a distinct cone. The following is its synonymy:—*M. albipunctum* var. *majus*, Haw. in Phil. Mag. (1826), p. 127. *M. aloides*, Salm-Dyck, Mesemb. § 4, fig. 3: Sonder in Fl. Cap. vol. ii. p. 396: Berger, Mesemb. p. 260, not of Haworth.

SOUTH AFRICA. Locality unknown. It was raised at Kew in 1823 from seeds collected by *Bowie*.

§ BILOBA.

M. APIATUM, *N. E. Br.* Corpuscula 2½–5 cm. alta, compresso-oblonga, apice biloba, microscopice subpuberula, subglauco-viridia, conspicue punctata, lobis rubro-marginatis. Calyx 5-lobus, glaber; tubus in corpusculum inclusus; lobi sæpe exerti, 6 mm. longi, oblongi, obtusi, pallide virides.

Petala 40–45, patula, 3–4 seriata, circa 1 cm. longa, lutea. Stamina numerosa ; filamenta pallide aurantiaca ; antheræ luteæ. Stigmata 5–6, staminibus longiora, subulata, aurantiaca.

LITTLE NAMAQUALAND. Western slopes of a ridge between Daunabis and Bethany Drift, *Pearson*, 6058 !

This species is allied to *M. bilobum*, Marl., but is readily distinguished by the conspicuous dots which cover the whole body of the plant. In colour it is also of quite a different and much whiter green, and the cells of the epidermis are altogether different, being developed so as to form an almost puberulous surface, slightly velvety to the touch.

M. QUÆSITUM, *N. E. Br.* Corpuscula 10–15 mm. alta, 9–13 mm. lata et 7–9 mm. crassa, late obovoidea, apice subtruncata, brevissime biloba, in carinam subacutam compressa, fissura centrali 2–4 mm. longa, microscopice subpuberula sed oculo nudo glabra, pallide viridia, distincte vel obscure punctata vel omnino immaculata. Flores ignoti.

NAMAQUALAND. Upper south-western slopes of Jackals Mountains, near Sendlings Drift, *Pearson*, 6123 !

Described from living plants sent by Prof. Pearson to Kew in 1911, which have not yet flowered. It is one of the most distinct species in the group, and is allied to *M. nuciforme*, but is much smaller and has a quite different epidermal surface. Under cultivation this species varies according to the moisture, light, and soil in which it is grown ; sometimes being short and sometimes globosely obovoid, with the dots very conspicuous, at others longer and more oblong-obovoid, with the dots indistinct or not visible except when held to the light.

§ CARINANTIA.

M. CARINANS, *Haw.* Stemless or nearly so, tufted. Leaves more or less incurved, the younger ascending, the older widely spreading, 4½–9 cm. long, 8–10 mm. broad, and about 8 mm. thick at the base, flat above, rounded on the back at the base and bluntly keeled at the upper part, acute, one leaf of each pair having the keel dilated near the tips so that the leaf is 10–12 mm. thick at that part, the other leaf tapering to an acute point without any dilation of the keel, glabrous, glaucous-green, roughish from being covered with numerous slightly prominent dark green dots. Flowers unknown to Haworth, but G. Don describes them thus:—"Flowers by threes, yellow, expanding in the evening."—*M. carinans*, Haw. Rev. p. 90 (1821): DC. Prodr. vol. iii. p. 423 : G. Don, Gen. Syst. vol. iii. p. 131 : Sonder in Fl. Cap. vol. ii. p. 400, not of Berger.

SOUTH AFRICA. Locality and collector unknown.

This plant Haworth states was sent to him by Salm-Dyck, and in the Kew Herbarium there is an original coloured drawing of it, labelled "*Mesemb. carinans*, Haw. Received from the Prince of Salm in the year 1823" and dated "Nov. 21, 1823." From this drawing and Haworth's description the above is compiled, which I give here because a much smaller allied plant, entirely different in appearance, has been described by Berger as being *M. carinans*. See *M. granulatum*, N. E. Br.

M. GRANULATUM, *N. E. Br.* Planta acaulis vel subacaulis, basi cæspitoso-ramosa, absque floribus 3–4½ cm. alta. Folia cruciatim opposita, conferta, 2–5½ cm. longa, basi 5–7 mm. lata et 3–5 mm. crassa, attenuato-subulata, acuta, supra plana, subtus basi convexa superne carinata, carina sæpe prope apicem dilatata, glabra, dense minute granulato-tuberculata, hebetato-viridia, vix glaucescentia, tuberculis atro-viridibus vel fusco-viridibus. Peduuculus uniflorus, 4–5 cm. longus, basi bibracteatus. Bracteæ 7 mm. longæ, erectæ, acutæ. Calyx 5-lobus; lobi subæquales, revoluti, 5–7 mm. longi, 4–4½ mm. lati, oblongo-ovati, obtusi. Corolla circa 2½ cm. diametro; petala numerosa, 7–10 mm. longa, 1 mm. lata, linearia, acuta, lutea. Stamina numerosa, 3–5 mm. longa. Stigmata 5, staminibus longiora, circa 11 mm. longa, filiformia.

Plant stemless or nearly so, branching at the base and forming a clump 3–4½ (or including the flowers about 7–8) cm. high. Leaves 6–8 to a growth, cruciately opposite, crowded, connate, the outer widely spreading, the inner incurved-ascending, 2–3½ cm. long, 5–7 mm. broad and 3–4 mm. thick at the base, flat above, with obtuse side angles, rounded on the back at the base and obtusely keeled (often obliquely) at the apical part, gradually tapering from the base to an acute apex when viewed from above, and in side view most of them of about the same thickness for three-fourths of their length, then tapering to an acute point, others with the keel at the apical third dilated so that the leaf is there about 5–5½ mm. thick, acute; surface glabrous, rough, from being densely covered with minute tubercles all over, dull green, with a slight greyish (or scarcely glaucous) tint and the dot-like tubercles dark green. Perhaps when exposed to the sun in the open air the leaves may be more or less purple-tinted. Peduncle terminal, 1–3-flowered, 4–5 cm. long and about 2 mm. thick, with a pair of bracts 5–7 mm. above its base. Bracts about 7 mm. long, erect, resembling reduced leaves, acute. Calyx 5-lobed, green or reddish, tuberculate-dotted like the leaves; lobes subequal, revolute at the tips, 5–7 mm. long and 4–4½ mm. broad, oblong-ovate, obtuse, one of them narrowly membrane-margined at the apex. Corolla about 2½ cm. in diameter, but only seen when faded; petals numerous, apparently in 2–3 (or more?) series, 7–12 mm. long, 1 mm. broad, linear, acute, light yellow, not gland-dotted when dry. Stamens numerous, 3–5 mm. long. Stigmas 5 in the flower examined, free to the base, much exceeding the stamens, about 11 mm. long, filiform.—*M. carinans*, Berger, Mesemb. p. 245 (1908), not of Haworth.

SOUTH AFRICA. Locality and collector unknown.

Described from a living plant which flowered in August, although according to Berger it also flowers in May.

This species has been mistaken by Berger for *M. carinans*, Haw., which is two or three times larger and different in general appearance, although undoubtedly allied.

§ FISSA.

M. Heathii, *N. E. Br.* Acaulis. Folia 2 vel 4; si 2 erecta et in corpus 3–4½ cm. altum, 2–3 cm. latum et 15–20 mm. crassum, compresso-ovoideum vel oblongum obtusum ad medium vel ultra fissum connata, si 4 inferiora subpatula, glabra, albida vel albo-virentia. Pedunculus foliis subæquans compressus, 10–13 mm. latus. Calyx 7–8 lobus, glaber; lobi 6–8 mm. longi, 3½–5 mm. lati, oblongi vel ovati, obtusi. Corolla ad 4 cm. diametro; petala numerosa, 3–4 seriata, libera, 1½–2 cm. longa, ½–1½ mm. lata, linearia, obtusa, alba. Stamina numerosa in annulum erecto-patentia.

South Africa. Ladismith Div. Between Garcias Pass and Ladismith, *Pillans*, 890!

Living plants of this species were sent in 1906 by Mr. N. S. Pillans to Kew, where they unfortunately soon died; a seed-pod on one of them was, however, given to Dr. F. H. Rodier Heath, after whom I have much pleasure in naming it, and who succeeded in raising a number of plants from the seeds and has subsequently distributed several of them. *M. Heathii* is allied to *M. fissum*, Haw., but is a very much larger plant and whiter in colour.

N.B.—*M. fissum* has been placed by authors under the section *Obtusa*, but it is obviously different in character from *M. fissoides*, Haw. (*M. obtusum*, Haw.), upon which that section was founded, and appears to me to have no affinity with that species, for *M. fissoides* is evidently a hard-leaved species with the fully developed leaves always spreading, and seems not to differ in any character except size from the section *Magnipuncta*; whilst *M. fissum* is a soft-leaved species, and its pair of leaves for a considerable period are closely applied to one another so as to form an oblong body cleft down the centre nearly to the base by a fissure resembling a knife-cut that divides but does not separate them.

I therefore would place *M. fissum* and its close ally *M. Heathii* in a group by themselves, for which the sectional name *Fissa* may be used.

§ FISSURATA.

M. damaranum, *N. E. Br.* Corpuscula 2–3 cm. alta, 2½–3½ cm. lata et 17–23 mm. crassa, obconica, truncata, fissura transversa 6–10 mm. alta biloba, lobis apice subplanis vel levissime convexis, glabra, pallidissime brunnea vel cinereo-brunnea lineis ramosis impressis brunneis notata. Calyx exsertus, 5-lobus, compressus, 10–11 mm. latus; tubus nullus; lobi 5–6 mm.

longi, 4–5 mm. lati, ovati vel oblongi, obtusi, subrufo-brunnei. Corolla 18–20 mm. diametro; petala libera, subbiseriata, 10–12 mm. longa, 1½–2 mm. lata, linearia, obtusa, alba. Stamina numerosa, in columnam 4–5 mm. longam exsertam collecta; filamenta alba, antheræ luteæ.

DAMARALAND. At Omaruru and Great Namaqualand at Aus. Collectors unknown.

Described from living plants. Flowering in October and November.

M. LOCALE, *N. E. Br.* Radix 10–12 mm. crassa lignosa ramosa. Corpuscula 6–12 mm. alta et 10–15 mm. lata, obconica, apice truncata cum fissura transversa brevissime biloba, glabra. Pedicelli 6–11 mm. longi, compressi, 2½ mm. lati, angustissime alati. Calyx 5-lobus, glaber; lobi 4 mm. longi, 2–3 mm. lati, ovati vel oblongi, obtusi. Petala libera, circa 35, laxa, 8 mm. longa, ¾ mm. lata, linearia, obtusa. Stamina numerosa. Stylus brevissimus vel subnullus; stigmata 5, filiformia, 2 mm. longa.

BEAUFORT WEST DIV. Near the Gamka River, *Burke*!

Described from a unique dried specimen in the Kew Herbarium. When alive the growths may be larger than the above measurements indicate, but as the pedicels of the flowers of this group are usually about as long as the growths, it is doubtful if they will be greatly exceeded, so that this species will therefore be one of the smallest of the group.

M. MARMORATUM, *N. E. Br.* Corpuscula 2–2½ cm. alta, 2–2½ cm. lata et 15–18 mm. crassa, subobconica, apice truncata, biloba, cum fissura transversa 10–12 mm. alta, levia, glabra, apice lactea et viride marmorata, lateribus leviter cinereo-violaceo tincta. Flores (fide *Pillans*) albi.

SOUTH AFRICA. Locality not stated, *Pillans*!

Described from living plants that have not yet flowered.

§ LINGUIFORMIA.

From the many investigations I have made of this group I have become convinced that it requires complete revision, with adequate modern descriptions made from living plants that undoubtedly grow wild in South Africa; for many of those now in cultivation in Europe under the names of various species published by Haworth that have come under my notice are not those species at all, but either other species or more probably hybrids raised from seeds produced in European gardens masquerading under names that do not belong to them. I think some or perhaps several of the species described by Haworth have died out of cultivation and these hybrids have gradually filled their places. It may be from this cause that Berger in his monograph of the genus places several perfectly distinct species as varieties of *M. linguiforme*, which in his work is a composite species and not confined to the typical *M. linguiforme*, Linn. It should also be noted that some of Salm-

Dyck's figures of this group are incorrectly named, as drawings of Haworth's typical plants at Kew clearly demonstrate. These plants hybridise freely, but with me fail to produce seeds when fertilised with their own pollen, as they seem to require to be cross-fertilised, so that seeds obtained from a nursery or any source where every care has not been taken to prevent hybridisation are quite likely to produce hybrids for the unsuspecting cultivator instead of the typical species.

The type species of this group is *M. linguiforme*, Linn., which was founded upon a plant figured and described by Dillenius as *M. folio scalprato.* Under this species Linné enumerates three varieties, which he called vars. β, γ, and δ, without giving them names, all founded upon plants figured and described by Dillenius. As these four plants of Dillenius certainly do not all belong to one species, Haworth separated them and gave each a distinct specific name ; for they differ from one another in appearance, in the size and shape of their leaves, in details of their flowers, and in their capsules and seeds. In modern monographs the distinctive characters of their capsules and seeds are ignored. Of these four species I have only seen seeds of the true *M. linguiforme*, Linn., which is remarkable in having the tubercles upon them covered with a minute pubescence as seen under a microscope—a structure that I have not seen on any other species in the genus that I have examined. I have examined seeds of some of the garden hybrids that are cultivated under the name of *M. linguiforme*, but they are quite different.

Unfortunately, when Haworth separated these plants specifically he selected the variety β of Linné as being the type of *M. linguiforme,* and gave a new name to the Linnean type of that species. Willdenow corrected this error, but other authors have copied and perpetuated without investigation the mistake made by Haworth. The correct synonymy of these four plants as I understand it is as follows :—

M. LATUM, Haw. Obs. p. 186 (1794) ; Misc. p. 32 ; Synop. p. 220 ; & Rev. p. 98 : Willd. Sp. Pl. vol. ii. p. 1026 : DC. Prodr. vol. iii. p. 422 : Berger, Mesemb. p. 241 under *M. linguiforme* var. *obliquum*, Berger. *M. medium*, Haw. Suppl. p. 88 (1819) ; & Rev. p. 95 : DC. Prodr. vol. iii. p. 421. *M. linguæforme*, Lodd. Bot. Cab. t. 1307, not of Linnæus. *M. linguiforme* var. β, Linn. Sp. Pl. ed. 1, p. 488 (1753). *M. linguiforme* var. *lata*, Weston, Univ. Bot. vol. i. p. 172 (1770), corrected to var. *latum*, Weston, English Fl. p. 162 (1775) : Salm-Dyck, Mesemb. § 8, fig. 8 β : Sonder in Fl. Cap. vol. ii. p. 404. *M. folio linguiformi latiore*, Dill. Hort. Elth. p. 236, t. 184, fig. 225, not fig. 226 as quoted by Linnæns.

SOUTH AFRICA. Locality and collector of the type unknown, but probably from the southern coast region (see under *M. medium*, p. 132).

According to an original coloured drawing at Kew of the typical *M. medium*, which was described from a plant introduced by Burchell, there appears to me no doubt whatever that it should be referred to *M. latum* ; for this drawing seems to me to represent exactly the same species as that figured by Dillenius above quoted, but I have not seen it. The locality where *M. medium* grows (see p. 133) is one from which the Dillenian plant might also have been obtained, as it was quite accessible to the older collectors.

M. LINGUIFORME, Linn. Sp. Pl. ed. 1, p. 488 (1753): Weston, Univ. Bot. vol. i. p. 172 : & Willd. Sp. Pl. vol. ii. p. 1026, not of other authors. *M. linguæforme*, Spreng. Syst. Veg. vol. ii. p. 514. *M. scalpratum*, Haw. Obs. p. 187 (1794); Misc. p. 32 ; Synop. p. 220 ; & Rev. p. 94 : Salm-Dyck, Mesemb. § 8, fig. 1 : DC. Prodr. vol. iii. p. 421, excluding syn. *M. obliquum*, Willd. : Sonder in Fl. Cap. vol. ii. p. 402. *M. linguiforme* var. *scalpratum*, Berger, Mesemb. p. 242, fig. 51, copied from Salm-Dyck's figure. *M. folio scalprato*, Dillen. Hort. Elth. p. 235, t. 183. fig. 224.

SOUTH AFRICA. Locality and collector unknown. Introduced into cultivation before 1732.

I think it very probable that *M. lucidum*, Mill. Dict. ed. 8, no. 43 (1768), is a synonym of this species. Miller thus describes it : "Mesembryanthemum without a stalk, and tongue-shaped lucid leaves, indented at the top." And as *M. linguiforme*, Linn. was in cultivation at that time, and is well marked by having a sort of notch near the top of the upper margin of many of its very broad and particularly tongue-shaped leaves, I think it most probable that *M. lucidum*, Mill. is the same plant, in spite of the fact that Miller also enumerates *M. linguiforme*, Linn. But it is certain that Miller did not possess all the species he enumerates, but included in his Dictionary plants that were in cultivation that had been described by other anthors, and he did not always recognise the plant he had as being the same as one described by another author, and I think his *M. lucidum* is a case in point. The *M. lucidum* of Haworth is certainly a different plant, and, I believe, is only a variety of *M. longum*.

M. LONGUM, Haw. Obs. p. 177 (1794) ; Misc. p. 34 ; Synop. p. 221 ; & Rev. p. 96, excluding varieties : Willd. Sp. Pl. vol. ii. p. 1027 : DC. Prodr. vol. iii. p. 421 : Sonder in Fl. Cap. vol. ii. p. 404. *M. linguiforme*, DC. Pl. Grass. t. 71, not of Linnæus. *M. linguiforme* var. δ, Linn. Sp. Pl. ed. 1, p. 488. *M. linguiforme* var. *longa*, Weston, Univ. Bot. vol. i. p. 172 (1770). *M. linguiforme* var. *longum*, Weston, English Fl. p. 162 (1775) : Berger, Mesemb. p. 240, excluding all varieties. *M. folio linguæformi longiore*, Dill. Hort. Elth. p. 238, t. 185. fig. 227.

SOUTH AFRICA. Locality and collector unknown. Introduced before 1732.

M. longum var. *flaccidum*, Haw. Synop. p. 222 ; *M. lucidum*, Haw. Suppl p. 89, not of Miller, may be a variety of *M. longum*, as Haworth originally considered it to be. I have not seen it, but the true *M. longum* existed formerly in the collection of Mr. Wilson Saunders of Reigate; all the other specimens cultivated under this name that I have seen are not that species at all, having long widely spreading (instead of ascending) leaves, and are possibly only garden hybrids.

Berger, Mesemb. p. 240, quotes Salm-Dyck, Mesemb. § 8, fig. 9, as representing this species, but so far as I have been able to discover, Salm-Dyck never published such a figure. He did, however, publish a plate numbered § 8, fig. 9 β, representing a plant which he named *M. longum* var. *declivum.* which is quite different from *M. longum.* So if Berger intends this plate and this plant by his quotation, the reference to Salm-Dyck's work above quoted must be erased, for Salm-Dyck's plant is certainly not *M. longum*, Haw.

M. OBLIQUUM, Willd. Sp. Pl. vol. ii. p. 1027 (1799): Spreng. Syst. Veg. vol. ii. p. 514. *M. lingueforme*, Haw. Obs. p. 182. *M. linguæforme*, Haw. Misc. p. 33; Synop. p. 221; & Rev. p. 97, excluding varieties: DC. Prodr. vol. iii. p. 422, not of Linnæus. *M. linguiforme* var. γ, Linn. Sp. Pl. ed. 1, p. 488. *M. linguiforme* var. *angusta*, Weston, Univ. Bot. vol. i. p. 172 (1770). *M. linguiforme* var. *angustum*, Weston, English Fl. p. 162 (1775). *M. folio linguæformi angustiore*, Dill. Hort. Elth. p. 237, t. 184. fig. 226, not p. 238, t. 185 as quoted by Linnæus.

SOUTH AFRICA. Locality and collector unknown. Introduced into cultivation before 1732.

The plant figured and described by Salm-Dyck, Mesemb. § 8, fig. 8, by Mordant de Launy and Loiseleur Deslongchamps, Herb. Gen. de l'Amateur, vol. i. t. 66, and by Drapiez, Herb. de l'Amateur, vol. iv. t. 229, under the name of *M. linguæforme*, Haw., seems to be the plant that Sonder in Fl. Cap. vol. ii. p. 404 has described under that name, and Berger, Mesemb. p. 241, under the name of *M. linguiforme* var. *obliquum.* But it is certainly not the true *M. obliquum*, Willd. (*M. linguæforme*, Haw.), which names were both founded upon the plant figured by Dillenius above quoted. That figure is a very fair representation of the plant, which is not at all like the plant of Salm-Dyck and Berger, being smaller and quite different in its appearance. Haworth (Obs. p. 185) mentions as a proof of its distinctness from the other species he had of this group, that the numerous seedlings he raised from it were always "exactly like their parents in every particular."

For *M. obliquum*, Haw. and other authors, see *M. lique*, N. E. Br., p. 103.

§ MAGNIPUNCTA.

M. OPTATUM, *N. E. Br.* Planta acaulis, 5–6 cm. alta, basi ramosa. Folia sæpe 4, æqualia, patula, $2\frac{1}{2}$–5 cm. longa, 7–11 mm. lata et 7–10 mm. crassa inferne semicylindrica, superne obtuse trigona, supra plana ve convexa subtus leviter et obtuse carinata, glabra, viridia, punctis atroviridibus dense sed inconspicue notata, apice ad angulos purpureo-tincta. Flos sessilis, bibracteatus. Bracteæ 5–6 mm. longæ, 4–5 mm. latæ, ovatæ obtusæ vel subacutæ, obtuse carinatæ. Calyx campanulatus, 5-lobus; tubus 6–7 mm. longus, 6½–7 mm. diametro; lobi 4–5 mm. longi, ovati, obtusi, revoluti. Corolla 3½–4 cm. diametro; tubus nullus; petala 50–60, subbiseriata, 25 mm. longa, 1½–1¾ mm. lata, spathulato-linearia, apice sæpe obtuse dentata, lutea, basi alba. Stamina numerosa; filamenta alba; antheræ luteæ. Stylus nullus; stigmata 10–11, staminibus subæquilonga, filiformia, flavida.

Nearly stemless, branching at the base, 5–6 cm. high. Leaves 4 or occasionally 2 to each growth or branch, equal, ascending-spreading, 2½–5 cm. long, 7–11 mm. broad, and 7–10 mm. thick, of about equal breadth and thickness throughout, flat or convex on the upper side, with obtusely rounded margins, very rounded on the back, obtusely or obscurely keeled at the apical part, obtuse or subacute and trigonous at the apex, smooth, glabrous, dull green, thickly but inconspicuously dotted with darker green, and tinted with purplish at the apical part. Flower solitary, terminal, sessile, with a pair of small sessile bracts at its base 5–6 mm. long and 4–5 mm. broad. Calyx cup-shaped, 5-lobed, smooth, glabrous; tube 6–7 mm. long and 6½–7 mm. in diameter, pale green; lobes revolute or reflexed, 4–5 mm. long, 3–5 mm. broad at the base, ovate, obtuse. Corolla 3½–4 cm. in diameter, scentless; petals 50–60, free, in about 2 series, spreading, later in the day becoming revolute, 25 mm. long and 1½–1¾ mm. broad, spathulate-linear, often obtusely toothed at the apex, bright yellow, white at the base. Stamens numerous, at first collected into a cylindric or slightly conical dense bundle about 6 mm. long, finally some of the outer stamens separate from the bundle and stand erect around it; filaments white; anthers deep yellow. Style none; stigmas 10–11, about 6 mm. long, filiform, pale yellowish.

SOUTH AFRICA. Locality unknown, *Simpson-Hayward*!

Described from a living plant brought to Kew in 1910 by Mr. G. H. Simpson-Hayward, who collected this and other species during a cricketing tour in South Africa. Allied to *M. sororium*, N. E. Br., differing in having more ascending, smaller, and differently coloured leaves, which differ also in transverse section, and by its flowers being sessile.

M. SORORIUM, *N. E. Br.* Planta nana, 7–10 cm. alta, basi ramosa, ramis 6–8 mm. crassis. Ramuli 4–6-foliati. Folia 3–6½ cm. longa, 11–15 mm. lata, basi 8–12 mm. crassa et prope apicem 9–13 mm. crassa, late patula, vel interiora adscendentia, supra plana vel leviter concava, dorso basi convexa, superne obtuse carinata, obtusa, glabra hebetato-cinereo-viridia, ubique punctis atroviridibus dense conspersa. Pedunculus 2 cm. longus, basi 4 mm. crassus, superne incrassatus, basi breviter bibracteatus viridis punctis magnis prominulis parce conspersus. Calyx 6-lobus; lobi subæquales, circa 10 mm. longi et 5 mm. lati, ovati, obtusi vel dorso breviter apiculati, punctati.

Corolla 5–6 cm. diametro; petala numerosissima, 4–5-seriata, exteriora $2\frac{1}{2}$–3 cm. longa, 1–$1\frac{1}{4}$ mm. lata, linearia, apice acuta, obtusa vel denticulata, lutea, dorso albida et apicem roseo-tincta. Stamina numerosissima, in annulum collecta; filamenta et antheræ lutea. Stigmata 10–14, filiformia, staminibus longiora, basi radiata, deinde erecta, pallide lutea.

A dwarf plant forming clumps about 7–10 cm. high, with short branching stems 6–8 mm. thick. Leaves 4–6 to a growth, all ascending or the outer widely spreading, very stout, 3–$6\frac{1}{2}$ cm. long, 11–15 mm. broad, 8–12 mm. thick at the base and 9–13 mm. thick near the apex, straight or occasionally slightly incurved and often curved to one side, flat or slightly convex on the upper side, rounded on the back at the base and obtusely keeled at the upper part, viewed from above with nearly parallel sides or slightly widened upwards to the middle or for three-fourths of their length, then tapering to a bluntly-pointed apex, and in side view usually slightly thicker near the apex than at the base, glabrous, dull grey-green, densely and conspicuously dotted with dark green all over the upper surface and back; the dots slightly prominent, viewed under a lens. Peduncle 1-flowered, 2 cm. long, 4–5 mm. thick at the base, thickening upwards, terete, not at all flattened, with two bracts 6–18 mm. long at its very base, light green, with some slightly darker green dots scattered along it. Calyx 6-lobed; lobes subequal, about 10–12 mm. long and 5–6 mm. broad, ovate, acute or obtuse, with a short dorsal point just below the tip, some of them with membranous margins, green or perhaps sometimes purplish-tinted, dotted with darker green. Corolla 5–6 cm. in diameter, expanding late in the afternoon; petals more than 100, in 4–5 series, the outer about $2\frac{1}{2}$–3 cm. long, the inner shorter, 1–$1\frac{1}{4}$ mm. broad, linear, acute or obtuse or some of them notched at the apex, rich yellow and slightly shining on the inner face, whitish and tinted with rosy at the apex on the back. Stamens very numerous, at first erect, then erectly-spreading, somewhat in a circle so as to leave a central space in which the base of the stigmas can be seen; filaments yellow above, whitish at the base; anthers deep yellow. Style none; stigmas 10–14, arising from the stout conical grooved top of the ovary, filiform, 10 mm. long, much longer than the stamens, radiately spreading at the base, then erect, covered with short hair-like papillæ or processes all along their inner face and of a paler greenish-yellow than the anthers.

South Africa. Locality and collector unknown.

Described from a living plant which was sent to me by Dr. F. H. Rodier Heath, who received it from a friend in South Africa, and believes that it was collected in the Karoo region, possibly in Ceres Division.

This species is allied to *M. magnipunctatum*, Haw., from which it differs by its smaller leaves marked with smaller and less conspicuous dots, and by its distinct peduncle, the flowers of *M. magnipunctatum* being sessile. From *M. optatum*, N. E. Br. it differs by its larger and very much more spreading leaves, which are more distinctly triangular in transverse section; the flowers are also larger and distinctly pedunculate.

§ OBTUSA.

M. fissoides, *Haw.* (Pl. **10.** fig. 40). Stems of old plants prostrate or underground, up to 5 cm. long, with very short branches, or plant nearly stemless, branching at the base. Leaves 2–4 to a growth, unequal, 17–25 mm. long, 6–8 mm. broad, and 5–6 mm. thick at the base, one of each pair a little longer than the other, viewed from above linear-oblong or of nearly equal breadth for the greater part of their length and rather shortly narrowed to an obtuse apex according to the figure, but according to Haworth "slightly attenuated at both ends *particularly* downwards" (he may, however, have meant when viewed from the side), semiterete, flat on the upper side, rounded on the back, the larger of each pair often dorsally thickened near the apex or subgibbous, "not glaucous but subglaucescent or greenish with an obsolete bluish tint," or "rather of a bluish green than a glaucous colour." Flower solitary, terminal, nearly sessile, with two leaf-like bracts at its base. Calyx thick, 6-lobed; lobes subequal, obtuse, some of them with membranous margins, reflexed when the flower is fully expanded. Corolla large and showy, expanding in the morning, with the facies of that of *M. linguiforme,* Haw. (not of Linn.), but the petals are somewhat revolute, much narrower, more than 1 in. (25 mm.) long, acute or emarginate at the apex, bright red or purple, somewhat paler at the base, and more distant (more lax) than in most species. Stamens erect; filaments white, slightly tinted with reddish on the upper part; anthers white or slightly yellowish. Stigmas 6, recurved above, white.—*M. fissoides,* Haw. Obs. pp. 135, 450 (1794); *M. obtusum* (a mere change of name for *M. fissoides*), Haw. Misc. p. 25 (1803); Synop. p. 206; & Rev. p. 86: Ait. Hort. Kew. ed. 2, vol. iii. p. 214: DC. Prodr. vol. iii. p. 418: Don, Gen. Syst. vol. iii. p. 127: Sonder in Fl. Cap. vol. ii. p. 394: Berger, Mesemb. p. 273.

South Africa. Locality unknown. Introduced by *Masson* in 1792.

Haworth (Obs. p. 135) states that this species is very much like *M. fissum,* Haw., but much less glaucous. I have not seen it, but judging from the drawing of it at Kew (copied on Pl. **10**), which was made from the Kew plant and therefore typical, it would appear to be a species of much firmer substance than *M. fissum,* which is soft and somewhat pulpy. The habit also is not much like that of *M. fissum,* as the leaves are larger and widely spreading. It appears to me that *M. fissoides* should be placed in the same group as *M. magnipunctatum.* Haworth seems to have changed the specific name from mere caprice, no reason being given for having done so. The above description is compiled partly from those of Haworth and partly from the drawing at Kew, which is labelled "*M. obtusum,* Haw. March 22nd, 1825." Haworth states that it is a very delicate species, very liable to be killed by too much moisture.

§ RINGENTIA.

M. ERMININUM, *Haw.* Plant very dwarf, forming tufts from the short growths or branches being crowded together, each 10–25 mm. high, including the flower. Leaves 6–8 to each flowering growth, crowded, ascending-spreading, 9–13 mm. long, 5–8 mm. broad, and 4–6 mm. thick near the apex, where they are about twice as thick as at the base, oblong or very slightly narrowed at the base, obtuse or obtusely pointed, flat above, with 2–3 small conical acute teeth on each margin at the apical half, keeled on the back at the upper part and rounded at the base, the entire surface rough from being thickly covered with minute conical tubercles, greyish-green, not shining. Flower solitary, terminal, sessile, or with the pedicel very much shorter than the leaves. Calyx 5-lobed; tube somewhat pear-shaped, very shortly campanulate above the ovary, slightly compressed, green, rather thinly sprinkled with more or less elongated and slightly prominent dark green dots; lobes revolute, 6–7 mm. long, 3–4 mm. broad. Corolla about 3 cm. in diameter, expanding about 6 P.M., closed during the day, somewhat half-globose, from the varying position of the petals, very faintly scented; petals very numerous, in 5–6 series, somewhat lax, the outermost series about 12 mm. long, very widely spreading or more or less bent downwards, the other series less and less spreading and the innermost erect and about 8 mm. long, all about ½ mm. broad and slightly incurved, very narrowly linear, acute, of a bright rich clear yellow on both sides, or reddish at the tips on the back, slightly shining. Stamens numerous, about 5–6 mm. long, erect and clustered, surrounded by the erect innermost petals and shorter than them; filaments and anthers yellow. Style about 1 mm. long, rising from the conical top of the ovary; stigmas 5, about 1½ mm. long, stout, contiguous, collected into a head about 2 mm. in diameter, pale green.—*M. ermininum,* Haworth in Phil. Mag. 1826, p. 127: Salm-Dyck, Mesemb. § 5, fig. 6 (the rough surface of the leaves badly represented): Sonder in Fl. Cap. vol. ii. p. 398: Berger, Mesemb. p. 272.

SOUTH AFRICA. Cradock, *Mrs. Bottomley* (*Pole Evans*, 1427)! Introduced by *Bowie* about the year 1823.

As this very distinct and interesting species is not well known, I here give a more complete description of it than exists in books. Its rough leaves are unlike those of any other species known to me and readily distinguish it from its allies. It is also somewhat remarkable as being one of the few night-flowering species with bright yellow flowers. The pose of the petals is described as I saw them between half-past eight and nine o'clock (Greenwich time) in the evening of July 14, 1918, when, from the various series of petals spreading at different angles, the flower was half-globose in form and exceedingly pretty, but whether it expands more fully at a later hour I do not know, as I was unable to observe it further that night, and the next morning I found it had been destroyed by some insect. As I was unable to see the style and stigmas that evening, they are described as I saw them in the partly devoured flower, so that they may not be quite as they were in the fully expanded flower or at maturity.

M. FELINUM, *Hill.* In all the monographs of this genus the authority for this name is credited to Haworth ; there are, however, three much earlier publications of the name, two of them being quoted by Haworth himself. All authors have founded the name upon the plant figured by Dillenius as quoted below, the correct citation for this species being as follows :—

> M. FELINUM, Hill, Hort. Kew. p. 155, name only (1769) : Weston, Univ. Bot. vol. i. p. 172, with description (1770) : Lam. Encycl. vol. ii. p. 486 (1786) : Haw. Obs. p. 161 (1794) ; Misc. p. 31 ; Synop. p. 216 ; & Rev. p. 89 : Ait. Hort. Kew. ed. 2, vol. iii. p. 218 : DC. Pl. Grass. t. 152 (not 158 as quoted by authors) ; & Prod. vol. iii. p. 419 : Salm-Dyck, Mesemb. § 5. fig. 2 : Don, Gen. Syst. vol. iii. p. 128 : Sonder in Fl. Cap. vol. ii. p. 397 : Berger, Mesemb. p. 267, f. 58. *M. ringens* var. *felinum*, Linn. Sp. Pl. ed. 1, p. 487 (1753). *M. rictum felinum repræsentans,* Dillen. Hort. Elth. p. 240, t. 187. fig. 230 (1732).

SOUTH AFRICA. Locality and original collector unknown. It was, however, also sent into this country about 1860 by Mr. T. Cooper, who did not remember where he collected it, but thought that it was somewhere between the Port Elizabeth and Albany districts, where the Dillenian plant was quite likely to have been collected.

Miller, in his Dictionary, ed. 8, no. 40, has united this species (by reference only, not by name) with *M. rostratum*, Linn., so that it is probable that he did not know either of these two utterly different species. I have reason to believe that South African botanists confuse *M. felinum* with *M. tigrinum*, Haw. When seen growing side by side, the typical plants are certainly very distinct and can be recognised at a glance, but there are hybrids between the two species or between *M. tigrinum* and some other species raised from seeds in Europe and perhaps also in South Africa that vary immensely and have caused the names to be used indiscriminately. The true *M. felinum* has from 4–6 teeth on each side of the leaf, which is not quite so much spotted as in *M. tigrinum*, and is somewhat lanceolate in outline, viewed from above. *M. tigrinum* has much broader leaves that are somewhat abruptly widened near the middle, with 9–12 teeth on each side, and are conspicuously and thickly spotted with white.

§ ROSTRATA.

In this group it may be well to explain that when in late autumn and winter the vegetating period commences, the first growth that develops from the old pair of leaves is usually a flowering growth, and often has a much longer cylindrical basal part than the vegetative growth that afterwards develops by the side of it. In the following descriptions the longest measurement of the cylindric body that is given usually refers to this flowering growth. Generally one vegetative growth only is formed, but occasionally two are developed, one on each side of the base of the flowering growth from the axils of the two old leaves. If the flower fails to develop, as frequently happens in this country from want of sunlight and heat, then the flowering growth subsequently develops a vegetative growth, and may possibly do so even when flower and fruit are formed, but of this I have no evidence.

M. BIBRACTEATUM, *Haw.* (Pl. 6. fig. 14). Stemless or nearly so, branching at the base. Leaves 6–8 cm. long, 8–10 mm. broad and 6–8 mm. thick at the base, thence, viewed from above, gradually tapering to an acute apex, and in side view of nearly equal thickness throughout, with one leaf of each pair acute or subacute and the other more or less dorsally rounded at the apex, flat on the upper side, rounded on the back at the basal part and keeled at the apical part, apiculate, each pair united at the base into a cylindric body or sheath 13–25 mm. long; surface smooth, glabrous, but probably with the keel and margins at the apical part very minutely puberulous-ciliate, glaucous-green, thickly dotted with dark green. Peduncle 10–12½ cm. long, according to Haworth with 4 bracts in two pairs, always much shorter than it, but the lower pair is really the pair of leaves from between which the peduncle arises, the true bracts (represented in bud on the Kew drawing, copied on Pl. 6. fig. 14) are placed a little below the middle of the peduncle, and are united into a sheath for half their length, their free portions very much shorter than the peduncle, 2–2½ cm. long, leaf-like, acute. Calyx usually 5-lobed. Corolla about 4 cm. in diameter, closed at night; petals in about 3 series, yellow. Stamens numerous. Stigmas 10, as long as the stamens and finally longer than them, subulate, erect, with spreading tips.—*M. bibracteatum*, Haw. Synop. p. 213 (1812); & Rev. p. 92. *M. rostratum* var. *brevibracteatum,* Salm-Dyck, Mesemb. § 3, fig. 7 *β*.

SOUTH AFRICA. Locality and collector unknown. Introduced into cultivation about the year 1803.

The above description is compiled partly from the account of it given by Haworth (all the characters given in his description being included), partly from Salm-Dyck's excellent figure of the plant in flower.

Haworth's description of this species is to a great extent a comparison of its characters with those of the plant he called *M. rostratum* (*M. tuberculatum,* Mill.), not the true *M. rostratum*, Linn. Haworth states that *M. bibracteatum* is very like his *M. rostratum* but a little more robust (whereas the true *M. rostratum*, Linn. is much stouter than *M. bibracteatum*), the leaves more glaucous, with fewer and larger dots, the peduncle longer, the bracts always much shorter (instead of being as long as or longer) than the peduncle, the calyx usually 5-lobed instead of always 4-lobed, the petals longer and more slender, the stamens larger and not hidden, and the stigmas, 10 (not 8), as long as or longer than the stamens, with spreading tips instead of very short and incurved, as they are in the plant Haworth understood as *M. rostratum*.

The relative amount to which the leaves become glaucous or green depends upon the amount of direct sunlight they receive ; so that to contrast this character with that of another species is not always of any value, unless both plants are grown side by side and equally exposed to light. Salm-Dyck's figure of this species is excellent.

Fig. 14 is copied from a drawing at Kew, labelled "*Mesembr. bibracteatum*, Haw. March 26. 1825."

M. BIFIDUM, *Haw.* (Pl. **9.** figs. 34–35). Nearly stemless or with age developing short stems 4–5 mm. thick, branching at the base. Leaves subequal, mostly 4–5 cm. long, 6–10 mm. broad and 5–8 mm. thick at the base, and of about the same thickness throughout, viewed from above gradually tapering from the base to an acute or somewhat obtuse apex, and in side view both leaves equally more or less obtusely rounded at the apex or one leaf more acute than the other, flat above, rounded on the back at the basal part and keeled at the apical part, very shortly or scarcely apiculate, with the keel at the apex cartilaginous, semitransparent and minutely denticulate, each pair united at the base into a cylindric body or sheath 13–20 cm. long ; surface smooth, glabrous, with the keel at the apex and sometimes (but not always) the margins microscopically puberulous-ciliate, of a bluish glaucous-green, thickly dotted all over, on the upper side as well as on the back with dark green, the united part or sheath usually more or less purplish or sometimes deep purple, or in winter of a lighter green than the leaves and very shining, the leaves being dull. Peduncle 8–10 cm. long, green or tinted with reddish, with a pair of bracts at its base 2–2½ cm. long, quite like the leaves. Calyx 4-lobed, the two outer lobes 10–12 mm. long, leaf-like, keeled, dotted, the two inner about 7 mm. long, with broad membranous margins, mucronate at or behind the apex. Corolla about 3½ cm. in diameter, expanding in the morning or about mid-day ; petals numerous, in about 3 series, the outer about 13–15 mm. long, the inner shorter, linear, acute, yellow. Stamens numerous, in several series, erect, not converging, the outer about 7 mm. long, somewhat spreading from the rest, the inner shorter, anthers whitish. Stigmas 8–10, erect or incurved, 3 mm. long, much shorter than the stamens, subulate, pale yellowish.—*M. bifidum*, Haw. Misc. p. 29 (1803) ; Synop. p. 212 ; & Rev. p. 92 : Ait. Hort. Kew. ed. 2, vol. iii. p. 216 : Sonder in Fl. Cap. vol. ii. p. 394 :

Berger, Mesemb. p. 258. *M. multipunctatum*, Salm-Dyck, Hort. Dyck. p. 357 (1834); & Mesemb. § 3, fig. 6: Sonder in Fl. Cap. vol. ii. p. 395: Berger, Mesemb. p. 257.

SOUTH AFRICA. Locality and collector unknown. In cultivation in 1795 according to Haworth.

The drawing of this species at Kew (partly copied on Pl. **9**) was made on "March 25, 1825," and is not very characteristic of the plant, being made at the end of the winter season before it had attained its proper growth. At the same period of the year I have seen the plant with exactly the appearance represented by the drawing, although later in the season it resumed the appearance so well shown in Salm-Dyck's figure of *M. multipunctatum*, which is certainly the same species as *M. bifidum*. Salm-Dyck states that *M. multipunctatum* is near *M. denticulatum*, but it bears no resemblance whatever to that species either in shape or colour, so that the *M. denticulatum* of Salm-Dyck is probably totally different from the plant Haworth described under that name.

The name *bifidum* was given to this plant because the first flower that Haworth saw had an abnormal 2-lobed calyx. He subsequently found that the calyx was 4-lobed, which is its normal condition.

M. CANDIDISSIMUM, *N. E. Br.* (Pl. **7**. figs. 25–26). Planta acaulis 6–13 cm. alta, basi ramosa, candida. Rami 2–4-foliati. Folia 2–9½ cm. longa, basi 8–14 mm. lata et 6–14 mm. crassa, deinde ad apicem acutum attenuata, supra plana, dorso basi rotundata, superne obtuse carinata, carina apice dilatata, alia integra, alia apice dorso dentata, omnino candida. Pedunculus 4–7 cm. longus, 3–4 mm. crassus, basi bibracteatus. Bracteæ foliiformes, integræ, 1–4 cm. longæ. Calyx 5–6-lobus; lobi 10–15 mm. longi, 8–10 mm. lati, elliptico-ovati, acuti vel obtusi, quorum tres membranceo-marginati. Corolla 5–6 cm. diametro; petala numerosa, 3–4 seriata, 10–25 mm. longa, linearia, apice acuta vel bidentata. Stamina numerosa, erecta, 4 mm. longa. Stigmata circa 17–19, erecta, circa 2 mm. longa, acuta.

Plant 6–13 cm. high, stemless, branching at the base. Leaves 2–4 to each growth, with the alternating pairs dissimilar; one pair entire at the apex and one of them more pointed than the other, the other pair with 1–5 teeth on the dilated keel at the apex; in the living plant seen and figured the toothed leaves are 2–3 cm. long, 8–10 mm. broad and 8 mm. thick at the base, and 10–12 mm. thick where the keel is dilated at the compressed apex, and the entire leaves are 3½–5 cm. long, 8–10 mm. broad and 6–7 mm. thick at the base, but according to dried specimens and the figure given by Mrs. Bolus, quoted below, on some plants they are 7–10 cm. long, 10–14 mm. broad and as much in the thickness at the base, the inner leaves erect, the outer more or less spreading, flat on the upper side and gradually tapering from the base to an acute and usually mucronate apex, very convex on the back at the basal part and keeled at the apical part, and the keel more acute and more dilated on the toothed than on the entire leaves, at the base united into a cylindrical body or sheath 10–25 mm. long; surface smooth, but appearing under a strong lens to be microscopically somewhat granular or very minutely papillate, not puberulous, entirely white or whitish, but when viewed with a lens faint scattered pallid dots can be seen on the back and along the margins. Flowers not seen on the living plant, but according to the dried specimens and the figure quoted, the peduncle is 4–7 cm. long and 3–4 mm. thick, with two leaf-like entire bracts 1–4 cm. long at its base. Calyx 5–6-lobed; lobes about 10–15 mm. long and 8–10 mm. broad, elliptic-ovate or ovate, acute or obtuse, three of them with broad membranous margins. Corolla 5–6 cm. in diameter; tube none; petals numerous, very spreading, in three to four series, the inner gradually smaller, 10–25 mm. long, linear, acute or notched at the apex, "white to pale pink" (*fide* Pearson). Stamens numerous, erect, in a dense cluster 10–12 mm. in diameter and about 4 mm. long. Stigmas 17–19 or perhaps sometimes fewer, about 2 mm. long, subulate, acute, erect. Capsule 17–19-celled. Seeds smooth, shining, pale brownish.—*M. denticulatum* var. *candidissimum*, Haw. Obs. p. 151 (1794); Synop. p. 216; & Rev. p. 91: L. Bolus in Ann. S. Afr. Mus. vol. ix. p. 142 with fig., and pl. 3. fig. B.

LITTLE NAMAQUALAND. Stinkfontein, *Pearson*, 5556! 6432! Eenriet, *Pearson*, 4068! 4072!

My drawing was made from a living plant of Pearson's 5556, cultivated at Kew, but the plant figured by Mrs. Bolus (Pearson 6432) is a larger form, stated to be from the same locality, the actual specimen from which her figure was made being now in the Kew Herbarium. The Eenriet specimens are smaller, and similar to the specimen I have figured. The white surface of the leaves is peculiar in its texture.

Haworth does not state who introduced the plant at Kew, but in all probability it was sent home by Masson.

M. DENTICULATUM, *Haw.* (Pl. **9**. fig. 33). Stemless. Leaves about 2 in. (5 cm.) long, somewhat curved inwards, the upper part compressed-triquetrous, dilated and keeled and often with 1–2 teeth on the back at the apex, somewhat attenuate downwards and towards the base, becoming rounded on the back, united at the base, dull whitish, rather hoary than glaucous, very slightly pubescent under a microscope. Flowers unknown.—*M. denticulatum*, Haw. Obs. p. 149 (1794); Misc. p. 30; Synop. p. 215; & Rev. p. 91: Ait. Hort. Kew. ed. 2, vol. iii. p. 217.

Var. GLAUCUM, *Haw.* Leaves broader (probably thicker from front to back is meant) at the points than in the type, very glaucous or glaucous-white, 2–3 toothed at the apex. Peduncles 4 in. (10 cm.) or more long, with two leaf-like 2-toothed bracts at its base. Calyx 5-lobed; lobes parabolic, more equal than in most species, 3 of them more or less membranous. Corolla 3 in. (7½ cm.) in diameter, petals narrow, acute or rarely bifid at the apex, pale straw-coloured, with the basal part white for a good way up, tinted on the back at the apical part with very pale rosy, very shining. Stamens numerous, 3 lines (6 mm.) long, the outer erectly-spreading, the inner crowded; filaments white; anthers straw-coloured, not shining. Stigmas about 15, hidden among the stamens, connivent, short, plumose-subulate, yellowish-green.—*M. denticulatum* var. *glaucum*, Haw. Obs. p. 151 (1794); Synop. p. 215; & Rev. p. 91.

SOUTH AFRICA. Locality unknown, introduced in 1793 by Grimwood and Wykes, who raised it from seeds sent to them from South Africa.

According to the drawing at Kew, labelled "*Mesm. denticulatum.* Aug. 23rd, 1826" (copied on Pl. **9**), the leaves are of pale bluish-green with purple tips and without dots. In all probability they are whitish-green.

Haworth (Obs. p. 150) remarks that "The attenuation at the base of the leaf and its tendency to curve inwards, added to its being compressed-triquetrous upwards, will alone abundantly distinguish it from all its congeners." It is difficult to understand what Haworth meant by the leaves being attenuated *downwards*. The drawing does not represent anything of the kind, unless it be the narrowing at the base from the back to the front of the three old spreading leaves at the base of the plant.

Only the flowers of the variety *glaucum* are described, and the description of them only occurs in the "Synopsis." It is stated to flower at the end of April, and the flowers to expand at midday and in the afternoon.

M. INSPERSUM, *N. E. Br.* (Pl. **6**. figs. 19–20). Planta subacaulis, basi ramosa. Rami procumbentes 5–18 mm. longi, 2–3 mm. crassi. Folia 5–7 cm. longa, basi 7–8 mm. lata et 4–5 mm. crassa, subæqualia, acuta, supra plana, dorso basi valde convexa apice obtuse carinata, basi in corpusculum cylindricum vel vaginam 2–4 cm. longum et 6–9 mm. crassum connata, glabra, glauco-viridia vel purpureo-tincta, dorso crebre punctata, intus basi pustula viride vel purpurea notata. Flores ignoti.

Nearly stemless, branching at the base and forming a clump. Branches prostrate, slender, 5–18 mm. long, 2–3 mm. thick. Leaves 5–7 cm. long, 7–8 mm. broad and 4–5 mm. thick at the base, subequal, viewed from above gradually tapering from the base to an acute apex, and in side view of nearly equal thickness throughout or slightly tapering to the apex, flat on the face, rounded on the back at the base and obtusely keeled at the apical part, but the keel is never dilated at the apex, united at their base into a cylindric body or sheath 2–4 cm. long and 6–9 mm. thick; surface smooth, glabrous, glaucous-green, or, when exposed to the sun in the open air, of a leaden or bluish-green, suffused or tinted with purple and thickly dotted with darker green on the back, usually without dots on the upper surface unless held to the light, when a few pellucid dots become visible; the tumour at the base of the upper surface is of a rich dark purple. Flowers unknown.

SOUTH AFRICA. Locality unknown, *Pillans*!

Described from a living plant sent to me by Mr. Pillans in 1911, which has never flowered. It is nearly allied to *M. tuberculatum*, Mill., but is a much smaller plant, the leaves being shorter and less stout than those of that species; they are also rather smoother to the touch, as the dots are not prominent unless the leaves are shrivelled. The dark purple tumour at the base of the upper surface of the leaves is a very conspicuous feature of this plant when it is fully exposed to the sun. I have never seen the tumour of *M. tuberculatum* coloured in the same manner. From both *M. tuberculatum*, Mill. and *M. bibracteatum* it is at once distinguished by its longer and more slender branches.

M. LECTUM, *N. E. Br.* (Pl. **9.** fig. 36). Planta 5–6½ cm. alta. Caulis prostratus, brevis, ramosus. Rami 2–4-foliati. Folia inæqualia, 2½–4 cm. longa, basi 5–10 mm. lata et 6–8 mm. crassa, apice 7–10 mm. crassa et dilatato-carinata, supra plana, altera apice obtusa vel acuta, altera uncato-acuta, glabra, leviter glauco-viridia, ubique dense punctata. Flores ignoti.

Plant 5–6½ cm. high, forming a clump. Stem subterranean or prostrate, branching. Branches short, about 5 mm. thick, each bearing 2–4 leaves according to season. Leaves unequal, at first erect, becoming spreading when the new growth is formed, 2½–4 cm. long, 5–10 mm. broad and 6–8 mm. thick at the base, and 7–10 mm. thick at the apex, where the obtuse dorsal keel is more or less dilated and compressed; the face or upper surface is flat and gradually tapers from the base to the apex, which on the larger leaf is incurved-hooked and acute with a short point directed forward, and on the smaller leaf is obtuse or acute; in side view the larger leaf is broadly rounded at the top and the smaller leaf less so; surface smooth, glabrous, of a slightly glaucous-green, thickly dotted all over on the face and back with darker green. Flowers unknown.

VAN RHYNSDORP DIV. Near Bakhuis, *Pearson*, 5485!

Described and figured from a living plant cultivated at Kew.

M. PRESSUM, *N. E. Br.* (Pl. **10.** fig. 46). Planta 6–7 cm. alta, subacaulis, basi ramosa. Ramuli 2–4-foliati. Folia 3½–6 longa, basi 9–14 mm. lata et 7–9 mm. crassa, erecta vel exteriora patula, supra plana, dorso basi valde convexa et obtusissime carinata et apice valde compressa et subacute carinata leviter dilatata, acuta vel obtusa et apiculata, basi in corpusculum cylindricum 15–25 mm. longum et 10–15 mm. crassum connata, glabra, glauco-viridia, punctis pellucidis atroviridibus crebre notata. Flores ignoti.

Plant nearly stemless, branching at the base and forming clumps 6–8 cm. high. Leaves 2–4 to each growth according to season, erect or the outer pair more or less spreading, the alternating pairs often dissimilar in size and thickness, equal or slightly unequal, 3½–6 cm. long, 9–14 mm. broad and 7–9 mm. thick at the base, whence, viewed from above, they gradually taper to an acute or subacute apex, and in side view are of equal thickness throughout or slightly dilated at the apex, which is obtuse and apiculate or one leaf of a pair is acute, flat above, very convex and very obtusely keeled on the back at the basal part and at the apical part subacutely keeled and some of the leaves very much compressed there, others less so, united at the base into a cylindric body 15–25 mm. long and 10–15 mm. thick; surface smooth, glabrous, very pale glaucous-green or whitish-green, thickly sprinkled on the back and sides and sometimes, but not always, sparingly so on the upper surface with darker green pellucid dots, which along the keel are usually more or less prominent, at least on the young growths, and at the apical part of the keel forming a slightly horny semi-transparent edge. Flowers not seen.

ORIGIN UNKNOWN.

Described and figured from a living plant. I believe that this plant is rather widespread in gardens, but I have no information as to its origin, and am inclined to think that it may be a hybrid between *M. rostratum*, Linn. and *M. tuberculatum*, Mill. raised from seeds produced in Europe, especially as some plants that I have seen and believe to be the same had their leaves very much less compressed than in the plant I have figured, yet otherwise quite the same. I have therefore dealt with the plant in this way, so that if found in South Africa it may be recognized.

M. PURPURASCENS, *Salm-Dyck* (Pl. 8. fig. 28). Nearly or quite stemless, branching at the base. Leaves erect or suberect, 6–8 cm. long, 10–14 mm. broad and 7–8 mm. thick at the base, flat on the upper side and gradually tapering from the base to a subacute or subobtuse apex, rounded on the back except at the apical part, where they are obtusely keeled, in side view of about equal thickness throughout and obtuse at the apex or shortly tapering to an acute point, united at the base into a cylindric body or sheath 10–15 mm. long; surface smooth, glabrous, light bluish-green, when fully exposed to the sun becoming more or less suffused with purple at the base and the apical part often bluer, dotted all over the back (but not on the flat upper surface) with dark green. Flowers unknown.—*M. purpurascens*, Salm-Dyck, Obs. Bot. p. 28, name only (1822): DC. Prodr. vol. iii. p. 420: Sonder in Fl. Cap. vol. ii. p. 395: Berger, Mesemb. p. 259.

SOUTH AFRICA. Locality and collector unknown.

The above description is made partly from an original drawing at Kew (copied on Pl. 8), labelled "*Mesemb. purpurascens*, Haw. Received from the Prince of Salm in the year 1823," and dated "Nov. 24th, 1823," and partly from a living plant. This species is allied to *M. rostratum*, Linn., but is not so stout, of a much bluer-green (not of such a whitish) colour and very much more thickly dotted all over the back; the purplish basal part is also a distinguishing feature, for I have never seen the sheaths of *M. rostratum* coloured in that manner.

M. robustum, *Haw.* (Pl. **9.** fig. 37). Stem prostrate, in old plants 2–6 in. (5–15 cm.) long, stout, branching, woody. Branches very short, stout, about 12 mm. thick in the drawing, clustered. Leaves (according to the drawing, very stout, about 5½ cm. long, 15 mm. broad at the base, thence tapering to an acute apex) subulate, half-cylindric at the base, where they are gibbous-pustulate on the upper side (keeled on the back), trigonous at the apex, rather obtuse (in side view), glaucous-green, dotted (all over on the upper surface and back, according to the drawing).—*M. robustum*, Haw. Misc. p. 28 (1803); Synop. p. 211; & Rev. p. 91: Ait. Hort. Kew. ed. 2, vol. iii. p. 216; Sonder in Fl. Cap. vol. ii. p. 395: Berger, Mesemb. p. 259.

South Africa. Locality unknown. Introduced by *Masson* in 1795.

The above description is a translation of that given by Haworth, combined with characters taken from a drawing by Mr. Duncanson (no. 205) at Kew, labelled "*Mesemb. robustum*, Haw.," which I have copied on Pl. **9.** Although the drawing is not dated it was probably made between 1823 and 1826, and doubtless represents typical *M. robustum*, Haw. It would appear that this is even a stouter plant than *M. rostratum*, Linn. (*M. quadrifidum*, Haw.), since Haworth states (Misc. p. 29) that *M. quadrifidum* resembles *M. robustum*, but is smaller, with more obtuse and less dotted leaves. The leaves may not always be more obtuse than those of *M. rostratum*, for, as I have pointed out on p. 58, alternating pairs of leaves often vary in this character on the same growth, but according to the drawing the dots on *M. robustum* are very much more numerous than they ever are on *M. rostratum*.

M. rostratoides, *Haw.* (Pl. **7.** fig. 27). Stem prostrate, 2–3 in. (5–7½ cm.) long, branching (according to the drawing, about 6–7 mm. thick, with branches 3–4 mm. thick). Leaves subulate-subtriquetrous, convex on the back at the base, obtuse, the older spreading, pustulate-gibbous at the base on the upper side, glaucous, dotted. (The drawing represents the leaves as being 12–25 mm. long, 7–9 mm. broad, and 3–4 mm. thick, with the flat upper surface tapering from the base to an acute apex, the back keeled and the apex in side view obtusely rounded or more or less acute, at the base they are connate into a sheath 5–10 mm. long; the upper surface as well as the back of the older leaves is represented as dotted). Peduncle terminal, long, cylindric, smooth, with 2 leaf-like bracts at the base. Calyx unequally 5-lobed, the 3 smaller lobes with membranous margins. Corolla yellow, almost as in *M. canum*; petals uniform, acute. Stamens erect; filaments short, white; anthers somewhat yellow. Stigmas 9, after fertilization as long as the stamens, revolute at the tips, plumose on the inner side.—*M. rostratoides*, Haw. Obs. p. 154 (1794). *M. ramulosum*, Haw. Misc. p. 29 (1803); Synop. p. 215; & Rev. p. 92: Ait. Hort. Kew. ed. 2, vol. iii. p. 217: Sonder in Fl. Cap. vol. ii. p. 394.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1791.

The above description is a combined translation of those given by Haworth together with characters taken from a drawing at Kew, labelled "*Mesembr. ramulosum*. March 26th, 1825," of which a part is copied on Pl. 7. I have maintained the name Haworth originally gave to it, as there is no reason evident or given for its being subsequently changed by him. The "pustulate-gibbous" character or swelling at the base of the upper side of the leaves is not a specific character of any of this group known to me, as it is common to all of them and also to some species belonging to other groups, when a new growth or a flower is being formed, and remains afterwards. I have not seen this species, and doubt if it is rightly placed in the section ROSTRATA.

M. ROSTRATUM, *Linn.* (Pl. 8. figs. 29–31 & Pl. 9. fig. 32). Stemless or nearly so, branching close to the ground and forming a clump with age. Leaves normally 2–4 to each growth, 5–8½ cm. long, 12–18 mm. broad and 8–10 mm. thick at the lower part, ascending, more or less diverging except when very young, sometimes curved to one side, sometimes straight, flat on the upper side, which gradually tapers from the base to an acute apex, rounded on the back at the lower part, keeled at the apical part, united at the base into a cylindric body or sheath 12–20 mm. long, and usually 15–20 (or on small growths about 10) mm. thick, which for part of the year is invested with the dried-up sheath of withered leaves, smooth, glabrous, uniformly of a pale whitish-green or somewhat chalky-green, dotted with darker green on the back, chiefly at the apical part and along the margins and keel, but sometimes there are a few dots on the back towards the base; in winter the dots are scarcely evident, and usually none are visible on the upper side, but if held against the sun or other strong light a thin sprinkling of immersed pellucid dots are visible on both surfaces and on the basal as well as the upper part of the leaves; the keel at the apex is somewhat pellucid and minutely crenulate or rough; often the alternating pairs of leaves are more or less different in form at their tips. Flowers unknown to me, but see note below—*M. rostratum*, Linn. Sp. Pl. ed. 1, p. 486 (1753), not of other authors. *M. quadrifidum*, Haw. Misc. p. 28 (1803), Synop. p. 212; & Rev. p. 91: Ait. Hort. Kew. ed. 2, vol. iii. p. 216: Sonder in Fl. Cap. vol. ii. p. 394: Berger, Mesemb. p. 257. *M. rostrum Ardeæ referens*, Dill. Hort. Elth. p. 240, t. 186. fig. 229 (1732).

SOUTH AFRICA. Locality unknown. Introduced into cultivation before 1732 by an unknown collector, and by *Masson* in 1795.

It is very extraordinary that this very old garden plant, which was introduced into this country at least 186 years ago, should have missed recognition as being the typical *M. rostratum*, Linn. by all monographers since the time of Linné, who founded that species upon the excellent figure and description of the plant given by Dillenius, which is so good that it would scarcely seem possible to mistake any other species for the plant he represented. Yet all authors since Linné have mistaken the totally different *M. tuberculatum*, Mill. for *M. rostratum*, Linn. This mistake seems incomprehensible, as any comparison of that plant with the figure and description given by Dillenius would at once show that they could not be the same species, the true *M. rostratum* being a very much stouter plant, with very much broader and thicker leaves of a whiter green, and with much fewer and less conspicuous dots than the species (*M. tuberculatum*) mistaken for it has, as may be seen at a glance by comparing the figure I give of *M. rostratum* on Pl. **8** with that of *M. tuberculatum* on Pl. **6** or with that of a flowering plant of *M. tuberculatum* published by Salm-Dyck under the erroneous name of *M. rostratum*.

The leaves of *M. rostratum* vary in size and curvature in different seasons and, I think, also in different soils, but none of the leaves represented on my drawing (which was made from a living plant) are as large as the two largest represented by Dillenius, and they are sometimes shorter and straighter than shown in my drawing, even on the same individual, and exactly as represented on Pl. **9**. fig. 32 by the figure of *M. quadrifidum*, Haw., copied from a drawing at Kew, labelled "*Mesemb. quadrifidum*, Haw. Received from the Prince of Salm." and dated "March 22nd, 1825," which is certainly identical with *M. rostratum*, Linn.; for the very same growth of *M. rostratum*, represented on the right-hand bottom corner of Pl. **8**, with curved leaves drawn in August 1917 after a damp sunless season, became in August 1918 after a drier and sunnier season exactly like the figure of typical *M. quadrifidum* on Pl. **9**. fig. 32. From all this, I am inclined to believe that neither Haworth nor subsequent authors can have compared either *M. tuberculatum* or *M. quadrifidum* with the figure of *M. rostratum* given by Dillenius, or they could scarcely help recognising that *M. tuberculatum*, which they have considered to be *M. rostratum*, was not that species; whilst *M. quadrifidum* was specifically identical with it, as may be seen from the copy of the drawing at Kew, together with a comparison of the above description with the following combined translation of the descriptions given by Haworth of *M. quadrifidum*:—Nearly stemless or stems of old plants 2–4 in. (5–10 cm.) long, decumbent, stout (about 7 mm. thick according to the Kew drawing), branching. Branches very short, clustered. Leaves half-cylindric at the base, trigonous and very obtuse at the apex (according to the drawing, 5½–6 cm. long, about 10–12 mm. broad and 8 mm. thick at the base and nearly as thick at the apex, flat on the upper side and there gradually tapering from the base to an acute apex, in side view one pair obtusely rounded at the apex and the alternating pair or one of them more or less acute, keeled on the back at the apical part), whitish-glaucous, with a few dots towards the tips or almost dotless (the drawing represents dots all over the back of some of the leaves, but none on the upper surface, except along the edges). Peduncle terminal, longer than the leaves, cylindric, thickened and somewhat rugose at the upper part. Calyx unequally 4-lobed, the two smaller lobes with white membranous margins. Corolla expanding in the morning; petals numerous, the inner gradually smaller, linear, mostly entire and acute, yellow. Stamens numerous; filaments pale; anthers whitish. Stigmas about 10, about as long as the stamens, subulate. Haworth remarks (Rev. p. 92) that *M. quadrifidum* is easily recognized by its whitish and nearly unspotted leaves and stout stem—a remark that equally applies to *M. rostratum*.

Dillenius figures some of the leaves as having a tooth or irregularity on each side near the tip, but this is an accidental or abnormal development, for they are normally quite entire, although occasionally they have 1–2 irregularities or teeth on their margins; indeed, the plant I have figured, in the following spring produced one leaf very similar to one of the toothed leaves represented by Dillenius. I believe this malformation is in some way connected with insufficient heat in winter, when the new growth is forming; it is certainly not of regular occurrence. It is either this toothing or irregularity that Linné refers to in his description by the words "externe tuberculatis," or else he has mistaken the dots on the back of the leaf as represented by Dillenius for tubercles, for there are no tubercles or raised dots on the back of the leaves either figured or described by Dillenius.

Miller, in his Dictionary, ed. 8, no. 40, has confused *M. rostratum* with *M. felinum*, quoting the references to these two species as belonging to the same plant, which he certainly would not have done had he been familiar with either or both of them.

I have not seen the type specimen of *M. rostratum*, Thunb., so am quite unable to say if it is the same as *M. rostratum*, Linn. or not. Dried specimens of this group would be very difficult to determine, as several species have much superficial resemblance to one another when alive, and their distinctive characters would disappear when the plants are dried.

M. TUBERCULATUM, *Mill.* (Pl. 6. figs. 12–13). Stemless, branching at the base. Leaves mostly 6–10 (sometimes up to 12) cm. long, 8–11 mm. broad, and 5–7 mm. thick at the base, whence they gradually taper to an acute apex when viewed from above, and viewed sideways are of nearly equal thickness throughout and acute or somewhat rounded at the apex, or one of each pair more acute than the other, flat on the upper side, rounded on the back at the basal part, keeled at the apical part, with the keel (under a lens) cartilaginous, semitransparent, and more or less tuberculate-crenate at the apex, and minutely pubescent when young, each pair united at the base into a cylindric body or sheath 1½–3½ cm. long and 10–15 mm. thick; surface glabrous to the eye, but (as in other species of the group) microscopically puberulous at the margins and keeled on the apical part, slightly tuberculate from the dots being slightly prominent, or, when very plump with water, nearly smooth, of a somewhat bluish-glaucous-green, tinged with purple at the tips when fully exposed to the sun, thickly dotted with dark green on the whole of the back and a thin sprinkling of rather less conspicuous dark green dots on the basal part of the flat upper surface, with the basal tumour whitish. Peduncle 7–10 cm. long, terete, without bracts, the so-called bracts of descriptions being the two terminal leaves of the growth, from between which the peduncle arises, and which are about as long as the peduncle. Calyx 4 (perhaps sometimes 5)-lobed, the inner lobes with membranous margins. Corolla about 4 cm. in diameter; petals numerous, in about 3 series, linear-lanceolate, acute, entire, unequal in length, yellow, shining. Stamens numerous, convergent, with white filaments and pallid anthers according to Haworth, collected into an erect group and yellow according to Salm-Dyck. Stigmas 8–10, subulate, much shorter than the stamens, closely incurved according to Haworth, but represented as erect by Salm-Dyck; both may be different stages of maturity, yellowish.—*M. tuberculatum*, Miller, Dict. ed. 8, no. 32 (1768), not of De Candolle. *M. rostratum*, Weston, Univ. Bot. vol. i. p. 171 (1770): Lam. Encycl. vol. ii. p. 486: Ait. Hort. Kew. ed. 1, vol. ii. p. 191; & ed. 2, vol. iii. p. 217: Haw. Obs. p. 152; Misc. p. 29; Synop. p. 214; & (including var. *tuberculatum*) Rev. p. 92: Salm-Dyck, Mesemb. § 3, fig. 7: Berger, Mesemb. p. 255, f. 55, I–III, not of Linné, and excluding from all authors synonyms not quoted here.

SOUTH AFRICA. Locality and collector unknown. Introduced into England before 1768.

This very old garden plant has been confused with *M. rostratum*, Linn. by all authors since Miller. From its being so confused it appears to me doubtful if it could have been compared with the figure and description of Dillenius upon which Linné founded that species, or it could never have been mistaken for it, as it is not nearly so stout and is quite different in appearance and colour from *M. rostratum*. In the length of its leaves *M. tuberculatum* varies considerably: Haworth, writing of it in 1794 (under the mistaken name of *M. rostratum*), states that they are "generally 2½ or 3 inches long; in the plant before me, some of them nearly six." Where the plant gets plenty of air and sunlight 3 to 4 inches is probably about the average, but where direct sunlight is absent in winter and the air confined, they often become much longer. The dots on the back of its leaves are much more prominent than in any species allied to it that I have seen, and on the newly-produced leaves in their most plump condition are distinctly perceptible to the touch and sight, when older ; if much swollen with water, they often seem quite smooth. I have not seen its flowers, and have compiled my description of them from those of Haworth and Salm-Dyck. My drawing on Pl. **6.** fig. 12 represents a branch developing a new growth early in the year, whilst fig. 13 represents in outline the longer two leaves of that same branch in the late summer of the same year.

M. VESCUM, *N. E. Br.* (Pl. **6.** figs. 15–18). Planta 3–4 cm. alta, subacaulis, basi ramosa. Ramuli 2–4-foliati. Folia 2–5½ cm. longa, 3–10 mm. lata et basi 2½–5 mm. crassa, erecta vel exteriora patula, supra plana, dorso basi convexa apice carinata, acuta vel obtusa et dilatata, apiculata, basi in corpusculum cylindricum 5–13 mm. longum et 4½–8 mm. crassum connata, glabra, glauco-viridia, apice et basi purpureo-tincta punctis pellucidis atroviridibus dense notata. Flores ignoti.

Plant forming clumps 3–4 cm. high, nearly stemless, branching close to the ground. Branches short, slender, prostrate. Leaves 2–4 to each growth, according to season, erect or the outer pair more or less spreading, the alternating pairs slightly dissimilar, those of one pair equal, of the other pair unequal, 2–5½ cm. long, 3–10 mm. broad and 2½–5 mm. thick at the base, flat on the upper side and there gradually tapering from the base to the acute or obtuse apiculate apex, the back rounded at the base and obtusely keeled at the apex, and the keel entire or minutely toothed, of nearly equal thickness throughout or one of each unequal pair in side view dilated and obtusely rounded at the apex, the other rather shorter and somewhat acute, united at their base into a cylindric body 5–13 mm. long and 4½–8 mm. thick ; surface glabrous, glaucous-green, very densely marked with darker green pellucid immersed dots, which are also present but less crowded and more inconspicuous on the flat upper side, with the keel at the apex and the united basal part under strong sunlight more or less of a dull purple colour.

LAINGSBURG DIV. Matjiesfontein, *Pillans* !

This very distinct species appears to be the smallest of the section *Rostrata* at present known. But it varies much in size ; the small growths figured represent the plant as it was in July 1917, whilst the outline (fig. 17) represents a growth on the same plant in November 1918, caused perhaps partly by a change of soil and a larger supply of water. In winter or late autumn, however, the species of this (and other groups) always increase in size under cultivation in England.

§ SEMIOVATA.

M. DUALE, *N. E. Br.* Planta cæspitosa, brevissime ramosa, 2–3½ cm. alta. Ramuli bifoliati. Folia 8–17 mm. longa, 7–10 mm. lata et 5–6 mm. crassa, supra visa anguste oblonga et obtusa vel elongato-triangularia et acuta, supra leviter convexa, dorso valde convexa apice leviter carinata, marginibus et carina subcornibus, glabra, glauco-viridia vel argenteo-viridia. Flores ignoti.

Van Rhynsdorp Div. Ridges near Bakhuis, *Pearson* & *Pillans*, 5483!

Allied to *M. necopinum*, N. E. Br., differing by its smaller size and more acute leaves, of which the edges are more distinctly horny than are those of *M. necopinum*. The whole appearance of the two plants when seen side by side is entirely different although not easy to express in words. *M. duale* is also less hardy or more delicate than *M. necopinum*.

M. necopinum, *N. E. Br.* Planta 3–4 cm. alta, basi ramosa, dioica. Folia sæpe 4, interdum 2 vel 6, basi connata, subpatula, 15–25 mm. longa, 10–16 mm. lata, 6–9 mm. crassa, basi crassiora, deltoidea vel deltoideo-oblonga, obtusa, supra plana, subtus valde convexa, apice obscure carinata, glabra, albida. Pedunculus inclusus, bibracteatus. Calyx exsertus, 6-lobus; tubus obconico-campanulatus, 4 mm. longus, 5 mm. diametro; lobi 2–4 mm. longi, ovati vel ovato-oblongi, obtusi, pallide virides, membranaceo-marginati. Corolla 14–18 mm. diametro; tubus nullus; petala numerosa, 2–3 seriata, 6–8 mm. longa, ½–¾ mm. lata, linearia, obtusa, lutea. Stamina numerosa, pallide lutea. Stigmata ad tuberculum reducta.—*M. testiculare* var. γ, Haw. Misc. p. 24; & Synop. p. 205. *M. octophyllum* var. β, Haw. Rev. p. 85.

South Africa. Locality unknown, *Masson*, *Pillans*!

This very distinct species was first placed by Haworth as a variety of *M. testiculare*, Ait., and afterwards as a variety of *M. octophyllum*, Haw., from both of which it widely differs. From the former by its much narrower differently shaped leaves and smaller flowers, and from the latter by its rather larger and broader leaves being as thick as or much thicker at the base than at the apical part, the reverse being the case in *M. octophyllum*; it is also a larger plant than the latter.

M. Pole-Evansii, *N. E. Br.* Planta acaulis, solitaria, usque ad 3–4 cm. alta, 4–5 cm. lata et 3–4 cm. crassa, pyriformis, apice convexa vel leviter emarginata, fissura angustissima vix ad medium bipartita vel in foliis duobus divisa, glabra, sub lente minutissime granulata, pallide subluteo-alba. Flores ignoti. Capsula 18–25 mm. diametro, ambitu elliptica, apice leviter convexa, circa 15-locularis. Semina numerosissima, minutissima, subgloboso-obovoidea, minute tuberculata, pallide brunnea.

Prieska Div. Locality unknown, *McLeod*!

Described from photographs, drawings, and material kindly sent to me by Dr. Pole Evans, after whom I have much pleasure in naming this very distinct species, which is perhaps more nearly allied to *M. lapidiforme*, Marl. and *M. testiculare*, Ait. than to any others. Its two leaves, however, are more than half-globose and not at all angular as they are in the former, and are not so long nor so much spreading as in the latter, their flat faces being

closely applied to one another or very narrowly separated, whilst the opaque minutely granular surface distinguishes it from both of those species.

M. SOCIUM, *N. E. Br.* Planta circa 2½ cm. alta, basi ramosa ; ramuli brevissimi, 2–4-foliati. Folia 8–20 mm. longa, 7–9 mm. lata et 5–6 mm. crassa, suberecta vel erecto-patula, semi-cylindrica, supra plana, dorso valde convexa, apice rotundata et obscure carinata, basi in corpus 8–10 mm. longum connata, levigata, glabra, glauco-viridia vel purpureo-tincta, immaculata. Flores ignoti.

VAN RHYNSDORP DIV. Dry ridges south-west of Bakhuis, *Pearson* 5489 !

Described from living plants sent to Kew by Prof. Pearson in 1911, which have not yet flowered.

M. SUBALBUM, *N. E. Br.* (Pl. **9**. figs. 38–39). Planta parva, cæspitosa, brevissime ramosa, 1½–2½ cm. alta. Ramuli bifoliati. Folia 5–10 mm. longa, 8–10 mm. lata et 5–8 mm. crassa, semiorbiculata vel breviter ovato-oblonga, apice obtuse rotundata, supra leviter convexa, dorso valde convexa et interdum ad apicem leviter carinata, subalbida vel argenteo-viridia. Flores ignoti.

VAN RHYNSDORP DIV. Near Bakhuis, *Pillans*, 5476 !

Allied to *M. duale* and *M. necopinum* described above, but differs in having shorter and much more obtuse leaves than either of those species, and they are entirely without a horny margin.

§ SPHÆROIDEA.

M. AGGREGATUM, *Haw.* Corpuscula 10–13 mm. alta, 7–9 mm. diametro, obconica, apice subplano-truncata obscure angulato-circulare cum carinula obscura et fissura centrali 1–2½ mm. longa, glabra, subcinereo-viridia vel subglauco-viridia punctis in lineas confluentibus vel distinctis inconspicue notata. Calyx 4-lobus ; tubus plus minusve exsertus vel inclusus ; lobi 1½–2 mm. longi, 1 mm. lati, oblongi, obtusi, rubri. Corolla 7–9 mm. diametro ; tubus 2½ mm. longus ; petala 12–16, laxe radiata, 3½–4½ mm. longa, ¼–½ mm. lata, angustissime linearia, rubro-purpurea. Stamina 12–16 ; antheræ exsertæ, pallide luteæ. Stylus ½ mm. longus ; stigmata 4, staminibus breviora, rubra.—*M. aggregatum*, Haw. Obs. Mesemb. pp. 131 & 419.

SOUTH AFRICA. Locality and collector unknown.

Haworth gives no description of this species ; all that he states concerning it is as follows :—On p. 131 under *M. nuciforme* he mentions that he has "some distant conjectures that this plant (i. e. *M. nuciforme*) may be the same as that called *aggregatum*." And on p. 419 he writes : "At Mr. Lee's there is a Mesembryanthemum called by the name of *aggregatum*, which I remember very little more about than the name. It is a small plant and can

scarcely be the same as my *nuciforme*. I have not seen the flowers and never had any specimen of it." It is not mentioned in his other books.

The plant above described is the one known to me as *M. aggregatum* for very many years. I first saw it in the collection of Mr. Wilson Saunders under that name about the year 1865, so that it may reasonably be accepted as the species intended by Haworth under that name, although it is somewhat remarkable that no other author has described it.

This species flowers in late October and November, and requires warmth to enable it to develop its flowers, which are, I think, the most unattractive in the whole group.

In the 'Index Kewensis,' *M. aggregatum* is stated to be the same as *M. grossum*, Ait. But that is an entire mistake, as is also the enumeration of *M. grossum*, Haw. as distinct from *M. grossum*, Ait., for that name of both authors belongs to one and the same plant, which is a branching leafy species, with terete channelled papulose leaves, and is utterly unlike any of the group to which *M. aggregatum* and *M. nuciforme* belong.

M. ALBERTENSE, *N. E. Br.* Corpuscula 10–15 mm. alta, 8–15 mm. lata et 8–13 mm. crassa, obconica, apice subplana vel leviter convexa, fissura centrali 1½–3 mm. longa, glabra, subnitida, leviter cæruleo-viridia, punctis paucis atroviridibus conspersa. Flores ignoti.

PRINCE ALBERT DIV. Near Prince Albert, *Pearson*.

Described from living plants, sent to Kew by the late Prof. H. H. W. Pearson.

M. ALTILE, *N. E. Br.* Corpuscula 20–27 mm. alta, 17–25 mm. lata et 15–20 mm. crassa, obconico-obcordata vel apice breviter biloba, fissura centrali 7–10 mm. longa et lobulis rotundatis, glabra, herbea, haud glauca, inferne purpureo-tincta, supra punctis atroviridibus dense notata. Calyx partim exsertus, 5-lobus ; tubus 5–6 mm. longus ; lobi oblongi vel ovato-oblongi obtusi. Corolla circa 2 cm. diametro, pulchre purpurea.

SOUTH AFRICA. Locality and collector unknown.

Described from living cultivated plants.

M. ASSIMILE, *N. E. Br.* Corpuscula 12–17 mm. alta, 9–12 mm. lata et 7–10 mm. crassa, obconica, apice plus minusve obcordata, fissura centrali 2–3 mm. longi, glabra, subcinereo-viridia vel leviter subcæruleo-viridia, apice punctis atroviridibus in lineas confluentibus et paucis distinctis et interdum punctis purpureis conspicue notata. Calyx 4–5-lobus ; tubus plus minusve exsertus vel inclusus, 3–4 mm. longus, membranaceus ; lobi oblongi, obtusi. Corolla 15–18 mm. diametro ; tubus 5–6 mm. longus ; petala circa 30, subbiseriata, 8–9 mm. longa, ⅓–½ mm. lata, acuta vel obtusa, lactea.

Stamina circa 30, triseriata, superiora subexserta ; antheræ lacteæ. Stylus brevis; stigmata 4, staminibus breviora, 2–3 mm. longa, albida.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants, which flower in October and November.

M. CATERVUM, *N. E. Br.* Planta parva, cæspitosa. Corpuscula 10–15 mm. alta, 7–12 mm. lata et 7–11 mm. crassa, obconica, apice ambitu orbiculata vel latissime elliptica, convexa, fissura centrali 1½–3 mm. longa, glabra, glauco-viridia, lineis tribus e punctis confluentibus formatis, fissura utrinque radiatis cum punctis distinctis conspersis hebetato-viridia notata. Flores ignoti.

LAINGSBURG DIV. Grootfontein, *Pole Evans*, 4975 !

Described from a living plant kindly communicated by Dr. Pole Evans, which has not yet flowered. By its subglobose appearance when viewed from above, pale glaucous-green colour, and the three rather faint radiating lines of confluent dots on each side of the orifice, this species is very easily distinguished from any other known to me.

M. GRATUM, *N. E. Br.* Corpuscula 13–15 mm. (vel interdum ad 20) mm. alta et 12–15 (vel interdum ad 21) mm. diametro, obconico-subglobosa, fissura centrali depressa 3–7 mm. longa, glabra, pallide subcæruleo-viridia, punctis opaco-viridibus conspersis et interdum fissura utrinque puncto rubro notata. Flores ignoti.

LITTLE NAMAQUALAND. On a barren slope north of Daunabis, *Pearson*, 6063 !

Described from living plants, which have not yet flowered in this country.

M. JUCUNDUM, *N. E. Br.* Planta cæspitosa cum caulibus parce ramosis 1½–4 cm. longis vestigiis vaginarum investis. Corpuscula 10–17 mm. alta et 10–16 mm. diametro, obconico-subglobosa, fissura centrali 1½–4 mm. longa, glabra, pallide glauco-viridia, primum plus minusve distincte punctata, demum absque punctis. Calyx 3–4-lobus ; tubus exsertus vel inclusus, 5–7 mm. longus ; lobi 2–2½ mm. longi, 1½–2½ mm. lati, oblongi vel ovati, obtusi, virido-reticulati. Corolla 15–23 mm. diametro ; tubus 10 mm. longus, subaurantiacus ; petala 30–40, 2–3-seriata, 6–12 mm. longa, ½–1 mm. lata, linearia, obtusa, pulchre purpurea. Stamina 30–40, 3–4-seriata, superiora exserta ; filamenta subaurantiaca ; antheræ luteæ. Stylus 8–10 mm. longus ; stigmata 4–5, subpatula vel adscendentia, 1½–2½ mm. longa, filiformia, viridia.

LITTLE NAMAQUALAND. In dry stony stream-beds, one mile south of Bethany Drift, locally common, *Pearson*, 6067 !

Described from a living plant. This is very distinct from any other species at present described. In form and colour of its flowers perhaps more nearly resembling *M. minutum*, Haw. than any other, but is very much larger in its growths and also differs by the formation of a distinct stem-system.

M. JUGIFERUM, *N. E. Br.* Corpuscula 18–26 mm. alta, 15–23 mm. lata et 13–16 mm. crassa, crasse obconico-obcordata, fissura centrali 5–10 mm. longa, lobulis obtuse carinatis, glabra, cinereo-viridia, punctis atroviridibus conspicue et crebre notata, et carina cum punctis in lineam confluentibus notata. Calyx 4–5-lobus; tubus 6–8 mm. longus; lobi 2–6 mm. longi, oblongi vel ovato-oblongi glabri, virides vel rubescentes. Corolla 18–30 mm. diametro, pulchre purpurea; tubus 7–10 mm. longus; petala 65–75, subquadriseriata, 9–15 mm. longa, ¾–1⅓ mm. lata, linearia, obtusa. Stamina numerosa, superiora exserta, alba. Stylus 3 mm. longus; stigmata 5, circa 2 mm. longa, plumoso-subulata.

SOUTH AFRICA. Locality unknown, *Pillans.*

Described from living plants. Flowering from October to December.

M. LABYRINTHEUM, *N. E. Br.* Planta pusilla, cæspitosa. Corpuscula 6–15 mm. alta, 5–10 mm. lata et 4–7 mm. crassa, obconica, apice ambitu elliptica vel elliptico-oblonga, convexa, fissura centrali 1–3⅓ mm. longa, glabra, cinereo-viridia vel viridia, purpureo-tincta, lineis brunneo-sanguineis vel atroviridibus pulchre labyrinthice notata. Flores ignoti.

SOUTH AFRICA. Locality and country unknown.

A small species allied to *M. pusillum,* N. E. Br., but differs from that species by the outline of the larger growths that are not flattened by having divided, being much more oblong in outline or much broader in proportion to their thickness, and by the more numerous and more crowded lines on the top, which form a somewhat labyrinth-like pattern. It has not yet flowered in this country so far as known to me.

M. LEVICULUM, *N. E. Br.* Corpuscula 10–15 mm. alta, 7–13 mm. lata et 7–14 mm. crassa, obconica, truncata, apice fere plana vel transverse depressa, cum fissura centrali 2–4 mm. longa, glabra, cinereo-viridia, punctis et lineis purpureo-brunneis vel atro-viridibus notata et fissura linea lata purpureo-brunnea vel atro-viride circumdata. Calyx 4-lobus, glaber; tubus 2½–4 mm. longus inclusus vel parte exsertus; lobi 1½–2 mm. longi, ovati, obtusi, rubescens. Corolla 10–14 mm. diametro; tubus 3–5 mm. longus, petala 20–25, laxa, patula, 4–9 mm. longa, ⅓–½ mm. lata, linearia, acuta, pallidissime lutescentia. Stamina circa 15–20 exserta, pallide lutea. Stylus 2 mm. longus; stigmata 4, subulata, acuta, pallide virescentia, 2 mm. longa.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants. Flowering in October and November. This species is allied to *M. pictum*, but is flatter and usually more circular at the top, of a more greyish-green with different markings, and the fissure or orifice is surrounded by a very distinct dark green or purple-brown rather broad line; whilst in *M. pictum* the line surrounding the fissure is very inconspicuous and different in outline.

M. NEVILLEI, *N. E. Br.* Corpuscula 8–10 mm. alta, 10–18 mm. lata et 8–15 mm. crassa, late obconica, apice truncata vel leviter transversim depressa, fissura centrali 2–5 mm. longa, glabra, viridia, punctis opaco-viridibus vel purpureis conspersis vel confluentibus notata. Calyx 5–6-lobus; tubus 3–4 mm. longus; lobi 2–2½ mm. longi, oblongi, obtusi, rubescentes. Corolla 12–15 mm. diametro; tubus 4–6 mm. longus; petala 45–50, biseriata vel triseriata, laxa, 5–8 mm. longa, ½ mm. lata, linearia, acuta, pallide luteo-albida. Stamina 30–36, triseriata, superiora breviter exserta, pallidissime lutea. Stylus ½ mm. longus; stigmata 4–5, adscendentia, apice recurva, 1–3 mm. longa, subulata, acuta, luteo-alba.

VAN RHYNSDORP DIV. Near Van Rhynsdorp, *Pillans*!

Described from living plants sent to me in November 1916 by Mr. Neville Stuart Pillans, after whom I have much pleasure in naming it. The flowers open in the evening and are closed during the day.

M. OBMETALE, *N. E. Br.* Corpuscula 10–20 mm. alta, 9–15 mm. diametro, obconica, apice truncata, fere plana, fissura centrali 1½–4 mm. longa, glabra, viridia vel cinereo-viridia, punctis distinctis et in lineas ramosas vel simplices confluentibus atroviridibus vel purpureo-brunneis notata. Calyx 4-lobus; tubus plus minusve inclusus, 5 mm. longus; lobi 2–3 mm. longi, oblongi, obtusi, rubescentes. Corolla 10–11 mm. diametro; tubus calyce brevior; petala 25–30, subbiseriata, 5 mm. longa, ½ mm. lata, linearia, acuta vel subdenticulata, lactea, nitida. Stamina circa 20–25, biseriata, superiora brevissime exserta; antheræ luteæ. Stylus 1½ mm. longus; stigmata 4, erecta, 3 mm. longa, plumoso-subulata, albida.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants. Flowering in October.

M. OVIFORME, *N. E. Br.* Planta pusilla, cæspitosa. Corpuscula 8–10 mm. alta et 4–7 mm. crassa, subcylindrica vel cylindrico-obovata, apice valde convexa, fissura centrali 2–5 mm. longa, glabra, viridia, punctis minute tuberculiformibus crebre notata. Pedicelli 6–8 mm. longi, 1–1½ mm. lati, inclusi. Calyx 6–7-lobus; lobi plus minusve exserti, 2–3 mm. longi, 1–2 mm. lati, ovati, obtusi, basi in tubum 1–1½ mm. longum connati. Corolla circa 11–13 mm. diametro, alba; tubus 2–2½ mm. longus; petala circa 30–40, patula, 5–6 mm. longa, ½ mm. lata, linearia obtusa. Stamina numerosa, 2–2½ mm. longa. Stylus nullus; stigmata 6, filiformia, 3 mm. longa. Capsula 4–5 mm. diametro, 6-locularis.

VAN RHYNSDORP DIV. On the Hardeveld, *Marloth*!

Described from a living plant kindly sent to me by Dr. R. Marloth. This species is one of the most distinct of the whole group, being easily recognized by its young growths being thickly covered all over with minute shining tubercle-like dots. When received, every growth was completely covered by the brown withered skin of a previous growth, through the orifice of which the calyx was partly or entirely exserted. The flowers were all withered, but the calyx is not at all membranous, and the petals I am informed are white.

M. PAGEÆ, *N. E. Br.* Corpuscula numerosa, dense cæspitosa, 8–10 mm. alta, 6–10 mm. lata et 5–9 mm. crassa, obconica, apice leviter convexa vel subplana fissura centrali 2–4 mm. longa, glabra, pulchre viridia cum fissura et lateribus purpureis absque punctis vel lineis. Calyx 5-lobus; tubus 2½–3 mm. longus; lobi 1–1½ mm. longi, ovati, obtusi, rubescentes. Corolla 8–12 mm. diametro, odorata; tubus 5 mm. longus, albidus; petala circa 24, subbiseriata, 4–6 mm. longa, linearia, obtusa, lutea ad apicem rubro-tincta. Stamina 2–3-seriata, superiora breviter exserta; antheræ luteæ. Stigmata 4–6, filiformia, 2 mm. longa.

LITTLE NAMAQUALAND. Near Garies, *Burke*!

Partly described from a living plant kindly sent to me by Prof. R. H. Compton, and partly from an excellent drawing of the plant in flower by Miss Mary M. Page, after whom I have much pleasure in naming this pretty species, as a slight acknowledgment of the great help she in conjunction with Mrs. L. Bolus has afforded me by sending and allowing me to make use of a considerable number of admirable coloured drawings of these plants as they grow in South Africa.

M. Pageæ is one of the prettiest and most distinct species of this group with which I am acquainted, for when the growths are in a fresh state the bright apple-green top and rich purple orifice and sides make an exceedingly effective and charming contrast. I have not yet seen its flowers.

M. PALLIDUM, *N. E. Br.* Corpuscula 17–35 mm. alta, 12–22 mm. lata et 9–20 mm. crassa, obcordato-obovoidea, apice breviter biloba, lobis obtuse rotundatis, fissura centrali 4–10 mm. longa, glabra, pallide calcareo-viridia, lobis lineis subcruciformibus et punctis subinconspicuis hebetato-viridibus notata. Calyx 3–5-lobus; tubus 4–6 mm. longus, inclusus vel plus minusve exsertus; lobi circa 3 mm. longi, oblongi, obtusi, pallide virides, rubro-tincti. Corolla 2½–3 cm. diametro; tubus 7–9 mm. longus, albus; petala 45–55, laxa, 2–3-seriata, 12–15 mm. longa, ½–1 mm. lata, anguste linearia, integra acuta, basi alba, superne rosea. Stamina circa 30, superiora brevissime exserta; antheræ albidæ. Stylus 1½–2½ mm. longus; stigmata 4, plumoso-subulata, 2–3 mm. longa, pallidissime virescentia.

WORCESTER DIV. On a mountain near Worcester, *Cooper*!

Described from living plants, which were introduced into this country by Mr. T. Cooper in 1860, and are now widely distributed in collections. It flowers in October and November.

M. PARVIPETALUM, *N. E. Br.* Corpuscula 12–13 mm. alta, 9–13 mm. lata et 7–10 mm. crassa, obconica, apice breviter truncato-biloba, fissura centrali 3–5 mm. longa, levia, glabra, lateribus purpureis, apice viridia punctis atroviridibus conspersa ; fissura purpureo-tincta. Calyx 5-lobus ; tubus valde compressus, 5–5½ mm. latus, inclusus vel breviter exsertus, pallide viridis ; lobi 2–3 mm. longi, ovati vel oblongi, obtusi, rubelli. Corolla valde compressa, 6–7 mm. diametro, pallidissime sublutea vel petalis pallidissime roseo-tinctis ; tubus 4–5 mm. longus ; petala circa 50, subbiseriata, 2–3 mm. longa, ⅓–½ mm. lata, linearia, acuta, erecto-patula. Stamina 40–50 breviter exserta, pallide lutea. Stylus vix ½ mm. longus ; stigmata 5, erecta, 3 mm. longa, pallide viridia.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants, which flower in October. The rich purple coloration of the sides, the broad V-shaped notch that forms the lobes at the top of each growth, the stout flattened tube of the corolla, and the very small petals, readily distinguishes this species from all others.

M. PAUXILLUM, *N. E. Br.* Corpuscula 10–15 mm. alta, 7–12 mm. lata et 6–9 mm. crassa, obconica, apice convexa vel levissime obcordata, elliptico-oblonga, fissura centrali 1½–4 mm. longa, glabra, cinereo-viridia vel hebetato-viridia, punctis et lineis brunneo-purpureis vel atroviridibus notata. Calyx 4-lobus ; tubus inclusus vel plus minusve exsertus, 3–4 mm. longus ; lobi 1½–2 mm. longi, ovati vel oblongi, obtusi, rubidi. Corolla 8–14 mm. diametro ; tubus 5–6 mm. longus ; petala 20–26, subbiseriata, laxa, 4–6 mm. longa, ½ mm. lata, linearia, subacuta, pallide straminea. Stamina 16–20, biseriata, superioribus exsertis, pallide flavescentia. Stylus 1–2 mm. longus ; stigmata 4, staminibus breviora, 2–3 mm. longa.

SOUTH AFRICA. Without precise locality, *Pillans* !

Described from living plants, which flower from September to November.

M. PICTUM, *N. E. Br.* Corpuscula numerosa, 8–15 mm. alta, 6–10 mm. lata et 5–8 mm. crassa, obconica, apice sæpe transversim depressa vel interdum subplana, fissura centrali 1½–2½ mm. longa, glabra, hebetato-viridia, punctis et lineis opaco-purpureis notata. Calyx 4-lobus ; tubus exsertus vel inclusus, 3 mm. longus ; lobi 1½–2 mm. longi, ovati vel oblongi, obtusi, rubelli. Corolla 6–15 mm. diametro, pallidissime straminea ; tubus 5–6 mm. longus ; petala 18–24, laxa, 5–8 mm. longa, ½ mm. lata, linearia, acuta. Stamina 12–20, superiora exserta ; antheræ luteæ. Stylus 1–1½ mm. longus ; stigmata sæpe 4, staminibus breviora vel æquilonga, 2–3 mm. longa, helveola.

South Africa. Locality unknown, sent to Kew and to myself by Prof. *MacOwan* in 1878.

Described from living plants. Flowering during September to November.

M. pilosulum, *N. E. Br.* Corpuscula 6–12, conferta, 12–20 mm. alta, 10–20 mm. lata et 8–15 mm. crassa, obovata, apice leviter obcordata, fissura centrali 3–5 mm. longa, breviter et molliter pilosa, omnino viridia vel apice purpureo-suffusa, impunctata. Flores circa 15 mm. diametro, pulchre purpurei.

Ladismith Div. South of Touwsberg, *Pole Evans*, 6927!

Described from a living plant and a photograph, for which I am greatly indebted to Dr. I. B. Pole Evans, who very kindly sent it to me in July 1919. This species is readily distinguished from every other in the Sphæroid group by its very distinctly hairy surface, the hairs being very fine, soft, and standing straight out from the surface. When received, the top of each growth was entirely purplish, but now the purple colour has entirely vanished and the whole plant is light green, without any markings. This may be due to lack of bright sunshine, and it is likely that the purple may return in the summer, being perhaps a colour protection from the fierce rays of the sun experienced in South Africa.

M. piluliforme, *N. E. Br.* Planta parva, cæspitosa. Corpuscula globoso-obconica, 3–4½ mm. diametro, apice convexa, fissura centrali ½–1½ mm. longa haud depressa, glabra, levia, hebetato-purpurea vel hebetato-viridia, punctis paucis atropurpureis vel atroviridibus notata et fissura centrali linea atropurpurea vel atroviridia circumdata. Flores ignoti. Capsula 2¼ mm. diametro, tetragona, 4-locularis.

South Africa. Locality and collector unknown.

Described from a living plant sent to me by the kindness of the authorities of the National Botanic Garden at Kirstenbosch. This minute species is one of the smallest known to me, its individual growths resembling in size and shape (as viewed from above) a small pill, thus suggesting the name.

M. pisinnum, *N. E. Br.* Planta perpusilla, cæspitosa. Corpuscula 8–10 mm. alta, et 5–7 mm. diametro, obconica, apice ambitu suborbiculata, convexa, fissura centrali 1–2 mm. longa, levigata, microscopice puberula, subcinereo-viridia vel viridia, punctis paucis conspersis inconspicue notata. Flores ignoti.

South Africa. Karoo, *Marloth*!

Described from a living plant communicated by Dr. R. Marloth. Its small size and microscopically puberulous surface readily distinguish this species from all others at present described, *M. fimbriatum*, Sond. (which is wrongly described as being glabrous) being its nearest ally, but that species

is a very much larger plant, and the flowers of the two species are probably also different.

M. PLACITUM, *N. E. Br.* Corpuscula numerosa, cæspitosa, circa 8–16 mm. alta, 7–13 mm. lata et 5–9 mm. crassa, obconica, apice leviter obcordata, fissura centrali 2½–3½ mm. longa instructa, levia, glabra, viridia vel plus minusve purpureo suffusa et lineis biarcuatis utrinque fissura et punctis atroviridibus vel atropurpureis conspicue notata. Calyx 4-lobus, glaber; tubus 4–6 mm. longus, plus minusve exsertus, pallidus, rubro-tinctus; lobi 2–3 mm. longi, lanceolati, obtusi, rubescentes. Corolla 15–20 mm. diametro, odorata; tubus 4½–9 mm. longus, albus; petala 40–60, subæqualia, 2–3-seriata, 7–10 mm. longa, ⅓–½ mm. lata, linearia, obtusa vel subacuta, alba, vel pallidissime luteola, vel pallide rosea. Stamina circa 15–16, triseriata, superiora exserta; filamenta alba; antheræ luteæ.

ROBERTSON DIV. Near Robertson, *Marloth*, 7985!

Allied to *M. ficiforme*, Haw., but smaller, with different coloration and smaller flowers, which expand in the evening and last for about a week.

M. PUSILLUM, *N. E. Br.* Planta pusilla, cæspitosa. Corpuscula 5–14 mm. alta, 4½–7 mm. lata et 3½–6 mm. crassa, obconica, apice ambitu orbiculata vel elliptica vel elliptico-oblonga, fissura centrali 1–2 mm. longa, cinereo-viridia vel viridia, lineis brunneo-sanguineis vel atro-viridibus irregulariter notata. Flores ignoti.

SOUTH AFRICA. Locality and collector unknown.

This small species is allied to *M. labyrintheum*, N. E. Br., but its fully-developed growths that are not more or less compressed by having divided are usually nearly circular instead of elliptic-oblong in outline when viewed from above, and the lines with which it is marked are much fewer, less crowded, and do not form such a labyrinth-like pattern, which varies much on different growths. From *M. signatum*, N. E. Br. its convex top and fewer markings at once distinguish it. I believe it has not yet flowered in England.

M. SAXETANUM, *N. E. Br.* Corpuscula numerosissima, densissime conferta, 4–6 mm. longa, 2½–5 mm. crassa, obconica, apice convexa, fissura centrali 1 mm. longa instructa, vaginis albidis circumdata, glabra, impunctata. Calyx 4(–5?)-lobus; tubus 1½–2 mm. longus, membranaceus; lobi 1 mm. longi, ovati, obtusi, rubescentes. Corolla 6–7 mm. diametro, albida; tubus 3–3½ mm. longus, gracilis; petala 14–20, laxa, 2½ mm. longa, ¼ mm. lata, linearia, obtusa vel acuta. Stamina circa 6, plus minusve exserta; antheræ 1¼ mm. longæ, luteæ. Stylus 1–1½ mm. longus; stigmata 4, staminibus breviora vel subæquilonga, circa 1½ mm. longa, filiformia.—*M. fimbriatum*, Marloth in Trans. Roy. Soc. South Afr. vol. i. p. 406, not of Sond.

Great Namaqualand. In fissures of rocks near Angra Pequena, flowering in May, *Marloth*, 4676, at Kew (4674 ex *Marloth*) !

Described from dried material sent to Kew by Dr. Marloth.

M. scitulum, *N. E. Br.* Corpuscula 13–15 mm. alta, 8–14 mm. lata et 7–13 mm. crassa, obconica, apice convexo-truncata vel leviter transversim depressa, fissura centrali 2–5 mm. longa, glabra, cinereo-viridia, lineis ramosis purpureo-brunneis pulchre notata. Calyx 4-lobus, membranaceus; tubus inclusus vel plus minusve exsertus, 3–3½ mm. longus; lobi 1½–2 mm. longi, ovati vel oblongi, obtusi, virides vel rubelli marginibus membranaceis. Corolla 6–16 mm. diametro; tubus 5–7 mm. longus; petala 30–35, biseriata vel triseriata, 5–8 mm. longa, ⅓–½ mm. lata, anguste linearia, acuta vel subobtusa, lactea. Stamina 15–20; filamenta alba; antheræ plus minusve exsertæ, pallide luteo-albæ. Stylus 2 mm longus; stigmata 4, subulata, 3–4 mm. longa, albida.

South Africa. Locality and collector unknown.

Described from living plants. Flowering in October. A very distinct species, easily recognized by the way in which the top is rather prettily marked out in a somewhat map-like manner by dark purple-brown or violet-brown branching lines.

M. signatum, *N. E. Br.* Planta cæspitosa. Corpuscula 8–15 mm. alta, 7–10 mm. lata et 5–8 mm. crassa, obconica, apice subplana vel leviter convexa, ambitu elliptica vel oblonga, fissura centrali 1½–2½ mm. longa, glabra, subcinereo-viridia, lineis atropurpureis vel atroviridibus confertis labyrinthice notata. Flores ignoti.

South Africa. Locality unknown, *Pillans*.

Described from living plants. I have not yet seen the flowers of this species, although on two successive years it tried to flower in November, but, probably owing to insufficient sun and heat, failed to develop its flowers, as only the tips of the calyx-lobes protruded from the orifice.

This species is nearly allied to *M. labyrintheum* and *M. pusillum*, but differs from both of them by the top of the plant being flattish or but slightly convex and very abruptly rounded into the sides or somewhat overhanging them, whilst those two species have the top of the plant convex and gradually rounded into the sides from the very apex.

M. subrisum, *N. E. Br.* Corpuscula 20–25 mm. alta, 14–16 mm. diametro, obconica, truncata, fissura clausa centrali 4–5 mm. longa utrinque impressa, glabra, albido-viridia, immaculata; vaginæ coriaceæ. Flores ignoti.

Van Rhynsdorp Div. On the top of a hill near Atties, *Pearson*, 5466!

Described from living plants, originally discovered and sent to Kew by the late Prof. Pearson in 1911. The plant has not flowered at Kew, nor with myself during the period it has been in cultivation.

It is allied to *M. calculus*, Berger, but is truncate instead of rounded at the top, the orifice is more depressed, with much more conspicuous dimples at the ends of it, and the colour is a rather whiter green. In appearance it is a very distinct species.

M. VIRIDICATUM, *N. E. Br.* Corpuscula 12–23 mm. alta, 10–15 mm. lata et 9–15 mm. crassa, obconica, apice elliptica vel suborbiculare leviter convexa transversim emarginata, fissura centrali 3–6 mm. longa, utrinque depressa, glabra, subprasina, omnino immaculata vel punctis distinctis vel in lineis confluentibus inconspicue notata. Flores ignoti.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants, which I have not yet seen in flower.

§ TERETIFOLIA.

M. CYLINDRICUM, *Haw.* (Pl. 7. fig. 23). Nearly stemless, branching at the base; branches crowded. Leaves about 3 inches (7½ cm.) long, according to Haworth (Synopsis, p. 209), but according to the drawing at Kew only about 3½–4 cm. long, triquetrous-cylindric (apparently, from the drawing, nearly cylindric, with the upper side flat on the basal half; they are probably faintly and very obtusely keeled on the back), obtuse, glaucous-green, dotted. (The drawing represents the leaves as being of a rather dull green, with darker green dots, and apparently faintly striate; the very tips are blackish brown and there are brown marks on some of the leaves, perhaps caused by some injury.) Peduncle 1–2 inches (2½–5 cm.) long, somewhat slender, compressed at the basal part, and bearing a pair of bracts at or above the middle. Bracts large, overtopping the flower, leaf-like. Calyx unequally 4-lobed; lobes leaf-like, terete or slightly subulate, very obtuse, two pairs of them nearly three times as small as the others, with membranous margins at the lower part. Petals numerous, imbricate, the longer about equalling the larger calyx-lobes in length, entire, obtuse, dark reddish (saturatissime rubicundis), shining. Stamens numerous, shorter than the petals; filaments rosy; anthers fuscous; pollen white. Stigmas 10–12, short, small, at length spreading, plumose, parabolically acuminate, whitish-green.—*M. cylindricum*, Haw. Obs. p. 411 (1794); Misc. p. 27; Synop. p. 209; & Rev. p. 105: Ait. Hort. Kew. ed. 2, vol. iii. p. 215.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* about the year 1792.

This distinct-looking species appears to have disappeared from cultivation. Haworth states that the leaves are "more glaucous, longer, more regular and more upright and cylindrical than those of *M. corniculatum*" (not the *M. corniculatum* of Linnæus, but the plant Haworth at first mistook for that species and afterwards named *M. diminutum*, see p. 63). Also (Misc. p. 27) that they are "longer and twice as narrow as those of *M. teretiusculum*." Whilst under *M. teretifolium* (Synop. p. 210) he states that they are "thicker and more glaucous, and less cylindric than in *M. teretifolium*."

The figure of *M. cylindricum* on Pl. 7. fig. 23 is copied from an original drawing at Kew, labelled "*M. cylindrica*, Aug. 25th, 1826."

§ TURRITA.

M. TURRIGERUM, *N. E. Br.* Corpuscula 10–13 mm. alta, 9–12 mm. ad apicem lata, 6 mm. crassa, ad medium biloba, parte inferiora leviter compresso-cylindrica, lobis 5–6 mm. longis erectis inferne subcylindricis apice subangulatis lineis elevatis in areas subdepressas irregulariter divisis, glabra, cinereo-viridia, apice lineis atro-viridibus notata, lateribus purpurpeo-tinctis et atro-viride punctatis. Flores ignoti.

MALMESBURY DIV. Vicinity of Klipheuvel Station, *Pillans*!

Described from a living plant in the collection of Mr. G. Elisha. A very remarkable species, totally unlike any other at present known, its two turret-like lobes being very distinctive.

Affinity doubtful.

M. EXIGUUM, *N. E. Br.* Stem almost none. Leaves 4 to each growth (evidently very small); the lower pair about one line (2 mm.) long, broadly connate and sheathing at the base, spreading, trigonous at the apex, acute, scabrid on the angles, glabrous, withering; the upper pair about the length of a finger-nail, erect, connivent, semiterete, flat above, convex beneath, papillose, with the keel below the apex serrulate and the angles scabrid, green or greenish-white? [literally translated, Thunberg's description of the colour is as follows:—semiterete or flat above, greenish, white (possibly greenish-white may be intended), convex beneath, papillose, green, angles scabrid]. Peduncle arising from the centre of the leaves, erect, 1-flowered, shorter than the leaves, angular. Corolla yellow.—*M. difforme*, Thunb. Fl. Cap. Ed. Schultes, p. 423 (1823), not of Linné nor of Haworth or other authors.

CALVINIA DIV. Karoo, between the Olifants River and Bokkeland, in Hantam and the Roggeveld, *Thunberg*.

I have given this plant a new name and added a translation of Thunberg's description of it, in order to call attention to what is evidently a somewhat peculiar species, so that in future it should not be overlooked; for it has been altogether misunderstood by all authors, although it is evidently a very distinct and remarkable species. Its affinities are doubtful, but on account of its papillate leaves it may have some affinity with the section *Moniliformia*, otherwise, from the outer pair of leaves being spreading and withering and the inner pair erect and connivent, I should conjecture that its affinity is with the section *Rostrata*. Thunberg probably never saw the figures in Dillenius, 'Hortus Elthamensis,' p. 252, t. 194. figs. 241–242, upon which *M. difforme*, Linn. was founded, or he could not possibly have associated this plant with that utterly different species. Sonder (who saw Thunberg's specimens), in the 'Flora Capensis,' vol. ii., actually refers this plant to two very different species, for on p. 395 he places it as a synonym of *M. denticulatum*, Haw., which has leaves several times as long, and, as the figure on Pl. **9**. shows, is otherwise different; whilst on p. 399 he places it as a synonymn of *M. namaquense*, Sond., which has peduncles "three or four times longer than the leaves" instead of shorter than the leaves as in Thunberg's plant, which, according to description, differs from all three of the above-mentioned species by having papillate leaves. *M. namaquense* also comes from a different region, these plants mostly being very local in their distribution.

II. **Stem evident, erect or prostrate, with distinct intervals (internodes) between some or all of the leaf-pairs.** (To p..123.)

§ ASPERICAULIA.

M. LIQUE, *N. E. Br.* I propose the above name for the plant described as *M. obliquum* by Haworth and published 22 years later than *M. obliquum* of Willdenow. The name *lique* has the same meaning. The synonymy of this species will therefore be :—*M. obliquum*, Haw. Rev. p. 183 (1821); & in Bot. Reg. t. 863: DC. Prodr. vol. iii. p. 442: Salm-Dyck, Mesemb. § 50, fig. 5: Sonder in Fl. Cap. vol. ii. p. 443: Berger, Mesemb. p. 96, not of Willdenow.

SOUTH AFRICA. Locality and collector not stated. Introduced into Kew Gardens in 1819, probably by *Bowie*.

The figure in the 'Botanical Register' was made from Haworth's type plant, and a good description of it is given there by Haworth himself.

§ CORALLINA.

M. LÆVE, *Ait.* (Pl. **10**. fig. 44.) An erect shrub two or more feet high, thickly covered with shoots and leaves, white-wooded. Leaves crowded, cylindraceous, curved, obtuse, amplexicaul, smooth, very glaucous. Flowers purple. Calyx 5-lobed; lobes oblong, obtuse.—*M. læve*, Ait. Hort. Kew. ed. 1, vol. ii. p. 187 (1789): Haw. Obs. p. 254; Miscel. p. 64; Synop. p. 302; & Rev. p. 154: Willd. Sp. Pl. vol. ii. p. 1044: DC. Prodr. vol. iii. p. 440: Don, Gen. Syst. vol. iii. p. 143.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1774.

This species is entirely omitted from the works of Sonder and Berger, who have maintained a totally different species (see *M. Thunbergii*, p. 106) under the name of *M. læve*, Thunb., which was published two years later than *M. læve*, Ait., and is a very different plant. The above description is compiled from those given by Aiton and by Haworth, who remarks (Obs. p. 254): "I have seen this plant, but have no specimen proper for description—it is a shrub." And (in Misc. p. 64) he states that "This rare species acquires an erect shrubby stem two or more feet high, thickly covered with shoots and leaves: it is very liable to rot in the winter and has never produced its flowers with me; they are said to be purple by Willdenow." Aiton states that it flowers from July to September, and places it in the red- or purple-flowered group, so that he evidently saw its flowers. He calls it the "Upright white-wooded Fig Marigold." From Haworth's remark that it is liable to rot in the winter, I suspect that it grows in a very dry region and has long since died out of cultivation. Haworth remarks of it: "This species strikes less easily from cuttings than most others, and although possessed of stiff upright woody shoots of one or two feet in height, never survives the third winter with me; but rarely dies under that age; and then appears to perish first at the root; for the branches survive many weeks after the root is dead. I have not heard of its flowering anywhere; nor is its bark white, but fuscous, which now causes me to doubt its being the true *M. læve* of Hort. Kew. above cited." The above is practically all that has hitherto been published concerning this plant, but in the Kew Herbarium there is a drawing of a branch of the Kew plant without flowers, labelled "*M. læve*, June 31 (sic), 1826." This drawing, of which I have copied a portion on Pl. **10**. fig. 44, quite corresponds with Aiton's description, except that the stem is light brown with white reflections as if it were very smooth and polished. Possibly with age the stem gets a white bark, and that Aiton described from an imported plant; for it is scarcely probable that the plant Haworth mentions as having seen in his earliest work upon the genus, published in 1794, would not be the true plant of Aiton, for it is evident that he knew and had complete freedom to inspect at all times the plants cultivated at Kew.

The Kew drawing represents a flowerless branch about 15 cm. long and 4 mm. thick at the base, branching in a pyramidal manner, woody below, with internodes 5–10 mm. long, those of the lateral branchlets being 1–5 mm. long, brown with white reflections, as if shining. Leaves 15–30 mm. long, 2¼–3½ mm. thick, rather closely placed on the branchlets, and having the appearance of being subcylindric, with the upper side more or less flattened, obtusely pointed at the apex, of a very glaucous-green.

This plant belongs to the section *Corallina* as defined by Haworth, which is quite different from the section *Corallina* of Berger, the latter being based upon *M. corallina*, Thunb.—a totally different plant, which Haworth doubtfully thought might be the same species as *M. læve*.

Since writing the above, Mr. N. S. Pillans has called my attention to some "Notes on *Mesembryanthemum*" by J. Britten in the 'Journal of Botany' for 1917, where, on p. 73, Mr. Britten also remarks that *M. læve*, Ait. and *M. læve*, Thunb. cannot be one and the same species, but adds no information that I have not already given in the above account.

§ CORNICULATA.

M. DISSIMILE, *N. E. Br.* As the plant figured and described as being *M. validum*, Haw. by Salm-Dyck (from whom both Sonder and Berger have copied their descriptions) is a totally different species from the true *M. validum* of Haworth (see p. 121) with solitary yellow flowers having 17–20 stigmas, and belongs to quite a different group, I propose the above change of name for it, the following being its synonymy:—*M. dissimile*, N. E. Br. *M. validum*, Salm-Dyck, Mesemb. § 15, fig. 8: Sonder in Fl. Cap. vol. ii. p. 409: Berger, Mesemb. p. 138, fig. 24, III (copied from Salm-Dyck), not of Haworth.

SOUTH AFRICA. Locality and collector unknown.

§ CRASSULINA.

M. INVALIDUM, *N. E. Br.* A change of name for the plant wrongly called *M. incomptum* in modern books.—*M. invalidum*, N. E. Br. *M. incomptum* (including var. *Ecklonis*), Salm-Dyck, Mesemb. § 56, figs. 4 & 4 β: Sonder in Fl. Cap. vol. ii. p. 451: Berger, Mesemb. p. 73, not of Haworth.

SOUTH AFRICA. Locality unknown. Probably introduced by *Ecklon*.

This is a plant with weak stems or branches 1–2 feet long, and is totally unlike the true *M. incomptum* of Haworth (see p. 131).

Salm-Dyck wrongly quotes Burchell as the introducer of this plant, for evidently some mistake has been made, as it is certainly not the same species as Burchell's plant, and I suspect that as the variety *Ecklonis* was introduced by Ecklon, that which Salm-Dyck calls typical *M. incomptum* was sent by him also, and some mistake made as to the labels, which often happens in large gardens. I see no difference between the two plants represented by Salm-Dyck on the two plates quoted other than any two specimens of one plant might show.

§ CYMBIFORMIA.

M. LEHMANNI, *Eckl. & Zeyh.* Since the publication of my description of *M. sexpartitum* the plant has altered its character and become exactly like *M. Lehmanni*, so that it must be placed as a synonym of the latter. When

I first saw the plant it appeared so distinct that I made the mistake of considering it to be a new species. Its synonymy is therefore as follows :—

M. LEHMANNI, *Eckl.* & *Zeyh.* Enum. Pl. Afr. Austr. p. 310 : Salm-Dyck, Mesemb. § 42, fig. 1 : Sonder in Fl. Cap. vol. ii. p. 430 : Berger, Mesemb. p. 129, fig. 22. *M. sexpartitum*, N. E. Br. in Kew Bull. 1908, p. 407.

UITENHAGE DIV. Near the Zwartkops River, *Zeyher*, 2576 ; Karoo, *Pillans* !

M. THUNBERGII, *Haw.* Stem about 1 ft. (30 cm.) long, decumbent, branching, terete, jointed, half as thick as a quill-pen, glabrous, greyish. Branches short, erect, leafy, similar. Leaves about 1 inch (25 mm.) long, erect, closely placed, decussately opposite, connate (at the base), trigonous or subterete, flattish above, obtuse, smooth, glabrous, not dotted. Flowers terminal on the branchlets, solitary, yellow. Calyx 4-lobed; lobes opposite, two of them shorter than the others.—*M. Thunbergii*, Haw. Misc. p. 86 (1803) ; & Rev. p. 150 : DC. Prodr. vol. iii. p. 437 : G. Don, Gen. Syst. vol. iii. p. 141. *M. læve*, Thunb. in Nov. Act. Ephem. Nat. Curios. vol. viii. App. p. 16 (1791), & Fl. Cap. ed. Schultes, p. 425, not of Aiton.

UITENHAGE DIV. Near the Sundays River, flowering in December, *Thunberg*.

I give a translation of Thunberg's description of this plant in order to call attention to it, because although Haworth correctly perceived that the plant which Thunberg described as *M. læve* could not possibly be the same as that which Aiton had two years earlier (in 1789) described under the same name, yet subsequent authors, not quoted above, have not only ignored Thunberg's description by replacing it with a description of *M. dubium*, Haw., but have also quite ignored the earlier *M. læve*, Aiton, which is a tall plant, differing in having a 5- instead of a 4-lobed calyx and purple instead of yellow flowers. Sonder and also Berger (who throughout his work seems to have compiled from Sonder and the descriptions given by Salm-Dyck without investigation) gives a description of *M. dubium*, Haw., based upon that of Salm-Dyck, as being a description of *M. læve*, Thunb. As I have not seen the type of *M. læve*, Thunb. I cannot say if they are correct in supposing it to be the same as *M. dubium*, Haw. or not. Yet, as Thunberg describes the leaves of *M. læve* as being 1 inch long, obtuse, smooth, without dots, and the calyx as 4-lobed, whilst *M. dubium* (the *M. læve* of Sonder and of Berger) is described and figured as having leaves 2 inches long, acutely mucronate, slightly scabrous, with numerous very minute dots, and a 5-lobed calyx, it is clear from these discrepancies either that *M. læve*, Thunb., and *M. dubium* are distinct species, or that one of them has been wrongly described. It should be noted, however, that the descriptions of *M. læve* given by Sonder and by Berger refer exclusively to *M. dubium*, Haw., and do not accord with either the description of *M. læve*, Aiton or that of Thunberg. Therefore, for the present I think the following references must be excluded from the synonymy of *M. Thunbergii*, viz.:—*M. læve*, Sonder in Fl. Cap. vol. ii. p. 408: Berger, Mesemb. p. 136, fig. 24, II (copied from Salm-Dyck). *M. dubium*, Haw. Misc. p. 39 (1803); Synop. p. 231; & Rev. p. 110, not of Obs. p. 471, which is *Odontospermum pygmæum*, O. Hoffm.: Ait. Hort. Kew, ed. 2, vol. iii. p. 222: Salm-Dyck, Mesemb. § 15, fig. 4 (not § 16 as quoted by Berger, nor t. 6 as quoted by Sonder). *M. decipiens*, Haw. Rev. p. 110 (1821).

It should be noted that the plant collected on the shore below Slang Kop, on the Cape Peninsula, by Wolley Dod (no. 3144), and distributed under the name of *M. læve*, Thunb., is scarcely likely to be the same as the Sundays River plant described by Thunberg, for apart from locality the label with the Slang Kop plant bears the record that its leaves are cylindric, whilst those of *M. læve*, Thunb. are flattish above; and it is certainly not *M. dubium*, Haw., as the epidermis of the leaves is totally different in structure—a character that has not been taken into consideration by monographers. The Slang Kop plant should be compared with *M. dissimile*, N. E. Br., see p. 105.

§ DIGITIFLORA.

M. ACUMINATUM, *Haw.* Extraordinary confusion seems to have been made by modern authors concerning this plant, as Salm-Dyck and those following him mistook another species (see *M. nothum*, N. E. Br.) for it, and then figured the real *M. acuminatum* under the names of *M. sulcatum* and *M. flexuosum*, which certainly represent one species only, and are again wrong determinations. As in these errors subsequent authors have followed him, I here give the synonymy of the four species in question (see p. 135). As Salm-Dyck has published (under wrong names) two good figures and descriptions of *M. acuminatum*, a description here is unnecessary; the following is its correct synonymy:—

M. ACUMINATUM, *Haw. in Phil. Mag.* 1824, p. 426: DC. Prodr. vol. iii. p. 445: Don, Gen. Syst. vol. iii. p. 147, not of other authors. *M. sulcatum*, Salm-Dyck, Mesemb. § 44, fig. 1: Sonder in Fl. Cap. vol. ii. p. 432: Berger, Mesemb. p. 119, not of Haworth. *M. flexuosum*, Salm-Dyck, Mesemb. § 44, fig. 7: Sonder in Fl. Cap. vol. ii. p. 433: Berger, Mesemb. p. 122, not of Haworth.

SOUTH AFRICA. Locality unknown. Introduced by *Bowie* about the year 1823.

In the Kew Herbarium is preserved an original coloured drawing of this species, labelled "*M. acuminatum.* Jan. 21st, 1826," which well agrees with Salm-Dyck's figures named *M. sulcatum* and *M. flexuosum* above quoted, but not with the figure of the plant he has named *M. acuminatum.* The tufts of small leaves in the axils of the stem-leaves are very characteristic of this species. The origin of this plant as stated by Salm-Dyck does not apply to it.

M. FLEXUOSUM, *Haw.* A shrublet 30–60 cm. (1–2 ft.) high. Stem somewhat flexuose, slender, shining, with opposite branches, at first erect then weakly decumbent, terete, glabrous to the eye but scarcely so to the touch (perhaps this indicates that they are slightly papillate?), greyish, the younger branches thicker, as in *M. fastigiatum.* Leaves crowded, flexuose-recurved, semiterete, very green. Flowers terminal, solitary. Peduncle nearly naked, terete, thickened above, with glistening papillæ. Calyx 5-lobed; lobes large, the two larger finger-like, as in *M. splendens.* Corolla larger than that of *M. reflexum* and the petals broader, in many series, obtuse, notched, yellowish, tinted with red on the back, the inner series gradually smaller and almost setaceous, pale yellowish. Stamens short; filaments white; anthers yellow. Stigmas 4 (not 5), short, very erect, subulate, longer (as they are described as short, this is possibly an error for shorter?) than the stamens, greenish-yellow. Ovary united to the sides of the calyx, not separated from it as in *M. reflexum.* Capsule 4-celled.—*M. flexuosum*, Haw. Misc. p. 61 (1803); Synop. p. 257; & Rev. p. 172: Ait. Hort. Kew. ed. 2, vol. iii. p. 231: DC. Prodr. vol. iii. p. 445: G. Don, Gen. Syst. vol. iii. p. 147, not of later authors.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1795.

The above is a translation of Haworth's original description of this species. He obtained it from Aiton, and states that it is larger and greener than *M. reflexum* and its flowers expand in the morning during July and August.

Unfortunately there is no drawing of this species at Kew, but from Haworth's description of the petals, stigmas, etc., it must be very distinct from the plant figured by Salm-Dyck (Mesemb. § 44, fig. 7) as *M. flexuosum*, which, as stated on p. 107, is identical with *M. acuminatum*, Haw.

M. HERBEUM, *N. E. Br.* (Pl. **10.** fig. 43). Planta humilis omnino herbacea, 7–15 cm. alta, basi in caulibus 3–5 ramosa. Caules 2–3 mm. crassi, erecti, superne sparsim dichotomo-cymosi, minute papulosi, rubescentes. Folia subpatula, 2–4 cm. longa, 2½–4 mm. lata, 2½–3 mm. crassa, lineari-semiteretia, acuta vel subacuta, supra canaliculata, basi subconnata, minute papulosa, sordide viridia. Flores in furcis cymæ solitarii. Pedicelli 2–6 mm. longi. Calyx sæpe 5-(interdum 4-) lobus, minute papulosus; lobi inæquales, 3–7 mm. longi, foliiformes, acuti. Corolla 10–18 mm. diametro; petala circa 30, uniseriata, 5–8 mm. longa, ½ mm. lata, linearia, acuta, primum alba, demum alba apicibus purpureo-tincta. Stamina numerosa, circa 3 mm. longa, exterioribus absque antheris petaliformibus, primum erecta, demum patula. Stigmata 5, erecta, 2½ mm. longa, subulata, acutissima, flavo-viridia, basi 5-tuberculata.

A dwarf herb, branching at the base into 3–5 erect stems 7–15 cm. high and 2–3 mm. thick, subterete, slightly flattened on the sides opposite the leaves, with internodes 5–20 mm. long, perhaps shorter on native grown plants, rather leafy, with very short branches in the axils of the leaves, the terminal part forking and by degrees developing into a leafy cyme with 2–3 alternate branches, minutely papillose, dull reddish or pale reddish-grey. Leaves ascending-spreading, sometimes recurving at the tips, 2–4 cm long, 2½–4 mm. broad and 2½–3 mm. thick, half-cylindric, acute, shallowly channelled down the face, rounded on the back, slightly united at the base, soft and flexible, glabrous, minutely papillose, green, not at all glaucous nor shining. Flowers developing one at a time in the forkings of the cymosely branched terminal part of the stem, odourless. Pedicels 2–6 mm. long, green. Calyx 4–5-lobed, minutely papillose, green; tube obconic; lobes unequal, 3–7 mm. long, resembling very reduced leaves, acute or subacute. Corolla on the first day of opening 8–10 mm. in diameter and usually entirely white, afterwards enlarging to 12–18 mm. in diameter, with the tips of the petals tinted with pale mauve-purple, expanding fully only in direct sunlight; tube none; petals about 30, in one series, widely spreading, 5–8 mm. long, ½ mm. broad, narrowly linear, acute. Stamens numerous, 2–3 mm. long, the outer without anthers and resembling short petals, at first bunched together, finally more or less spreading; filaments white, anthers light yellow. Stigmas 5, erect, 2½ mm. long, stoutly subulate, very acute, pale yellowish-green, surrounded at the base by 5 green tubercles on the top of the ovary, besides a series of green glands around the margin of the flat top of the ovary.

TRANSVAAL. Near Johannesburg, *Whiting*!

Described from living plants raised from seeds collected near Johannesburg, and sent to me by Mr. G. E. Whiting, who states that it grows in a red sandy soil plentifully mixed with stones. It is nearly allied to *M. Mahoni*, N. E. Br., which is quite wrongly placed in the *Crassulina* group by Berger. Both are dwarf plants and both develop their cymes in the same manner. Perhaps both should be placed near *M. sulcatum*, Haw.

M. NOTHUM, *N. E. Br.* This name I propose should be substituted for the plant masquerading in modern monographs under the name of *M. acuminatum*, which is not at all the same as *M. acuminatum*, Haw. As it is well figured and described by Salm-Dyck, it is unnecessary to give a fresh description of it here. Its synonymy will be as follows:—*M. nothum*, N. E. Br. *M. acuminatum*, Salm-Dyck, Mesemb. § 44. fig. 4: Sonder in Fl. Cap. vol. ii. p. 433: Berger, Mesemb. p. 121, not of Haworth.

SOUTH AFRICA. Locality and collector unknown.

The remarks of Salm-Dyck as to the origin of this plant apply only to the true *M. acuminatum* (see p.107) and not to *M. nothum*. This species appears to be allied to *M. longistylum*, DC., but differs in having larger flowers with stigmas not half as long as in that species.

§ MACRORHIZA.

M. NAPIFORME, *N. E. Br.* Root tuberous, turnip-shaped. Stem 2½–7½ cm. high. Leaves crowded, spreading, obtusely triquetrous (probably trigonous is meant), connate (at the base), resembling those of the Salt-wort (*Salsola kali*) in substance and taste. Flowers 1–3 together, subterminal, pedicellate, small, white. Calyx 5-lobed, with 2 lobes very long. Stigmas 5. Capsule subglobose.—*M. macrorhizum*, DC. Prodr. vol. iii. p. 425 (1828): Don, Gen. Syst. vol. iii. p. 132: Berger, Mesemb. p. 219, not of Haworth. *M. sp.*, Du Petit Thouars, Mélanges de Botanique, p. 37.

ISLAND OF BOURBON. Growing among volcanic rocks near the sea, *Thouars*.

I have changed the name for this plant, as *M. macrorhizum* of Haworth was published two years earlier than that of De Candolle, see p. 121.

§ MARCIDA.

M. PYGMÆUM, *Haw.* Plant tufted, 2–3 cm. high, with very short repeatedly forked branches above the soil. When at rest quite leafless, each branchlet clothed with fibrous sheaths and terminated by a small dead-looking whitish fibrous cone 4–7 mm. long and 3–4 mm. thick, from which during the growing season in late autumn there first bursts forth a pair of widely spreading leaves united only at their very base, 5–6 mm. long, 3–3½ mm. broad and 1½–2 mm. thick, deltoid-lanceolate, subacute or obtuse, slightly convex above, rounded beneath; from between the bases of this pair is soon after developed a second pair, which are united into at first a cylindric body with two small erect tooth-like points (representing the free tips of the leaves of which it is composed) at its apex; this cylindric body is soon followed by the development of a similar body at its base from one or both axils of the free leaves; with age the cylindric bodies become ovoid-conical; all are smooth and glabrous, not at all papillose, green, with numerous large and conspicuous pellucid dots when held against the light. The free leaves finally shrivel and dry up into brownish or greyish remnants 1–2 mm. long, whilst the cone gradually becomes fibrous and whitish, and assumes its resting appearance of being dead. Within it, however, are formed a pair of free leaves that will appear when the next season's growth takes place. Flowers not seen, but evidently developed when the new growth commences. Pedicels of young and mature fruit on dried specimens 10–12 mm. long, overtopping the growths. Sepals 6, about 2–2½ mm. long, deltoid-ovate, subobtuse. Capsule 5 mm. in diameter, 6-celled.—

M. pygmæum, Haw. Suppl. p. 98 (not 99 as quoted by authors); & Rev. p. 134: Berger, Mesemb. p. 116. *M. pigmæum*, Sonder in Fl. Cap. vol. ii. p. 425 (description very bad). *M. cigarettiferum*, Berger in Engl. Jahrb. vol. xlv. p. 225 (1910).

WORCESTER AND LAINGSBURG DIV. Karoo beyond Hex River, *Rehmann*, 2896 ! and in *Herb. Bolus*, 5647 ! Matjesfontein, *MacOwan*, 3316 ! *Brunnthaler* !

This curious little plant was discovered and introduced by Bowie about one hundred years ago, according to an original drawing at Kew of a type plant, which is labelled "*Mesembr. pygmæum*, Haw. Raised from seeds in 1817 collected by Mr. James Bowie." Haworth correctly describes its peculiar mode of growth, but places it in his section *Microphylla*, whilst Berger has referred it to the section *Rostellata*; yet there is no species in either of these groups that resembles it in any way either in habit or appearance. Its peculiar mode of growth is almost identical with that of the section *Moniliformia*, and it should be placed next that group, from which it differs by its dwarf tufted habit and small size, smooth (not papillate) leaves, and conspicuous pellucid dots; the flowers may also differ, but I have not seen those of either group. Therefore, as sections are maintained for the grouping of this genus, I have characterized (p. 62) a fresh section for its reception. Judging from the dried specimens seen, it does not flower very freely under natural conditions, and, although I have watched it for very many years, I have never seen it flower under cultivation.

M. cigarettiferum, Berger, is described from a plant of *M. pygmæum* at the period when the spreading leaves have not fully withered, whilst the conical terminal bodies have dried up into whitish bags of papery consistence containing a new pair of free leaves.

§ MONILIFORMIA.

This remarkable section is characterized by Haworth in his 'Revisiones' p. 93, and previous works as follows :—Deciduous, leafless in summer, with nodose-beaded or necklace-shaped branching stems 1–3 inches (2½–7½ cm.) long. Leaves 4 each year to each branchlet; the two primary connate nearly to the tips or constantly truncate at the sheaths; the two following elongated, 1–6 inches (2½–15 cm.) long, united at the base, withering-deciduous. Calyx or leaves crystalline-papillose.

In his 'Miscellanea,' p. 23, he gives the following account of the peculiar mode of growth of this group :—"At the approach of warm weather in spring, their leaves all decay, their vegetative faculties appear perfectly at a stand, and they seem more dead than alive until the following autumn; when they send forth from every extremity one or two pairs of the short connate leaves above described (under *M. pisiforme*); which, after an interval of a month or two, protrude from their common centres, the secondary pairs of long proper leaves; the daily increasing sizes of which, soon burst asunder the sheathing bases of the foliage of the preceding year; and in a great measure push them off."

Haworth places under this section two species only—*M. pisiforme*, Haw. and *M. moniliforme*, Thunb. The former is quite unknown to me, but *M. moniliforme* was in cultivation at Kew Gardens many years ago; unfortunately, I made only a small and very crude sketch of it without taking any notes, so am unable to say if Haworth's statement of its mode of growth is quite accurate, but as *M. clivorum*, N. E. Br. and *M. cognatum*, N. E. Br. described below seem to me to belong to the same group as *M. moniliforme* (compare for instance the short beaded branch of *M. clivorum*, Pl. 5. fig. 6, with the stem of *M. moniliforme* represented on the same plate), I am inclined to believe that the sequence of the development of the two kinds of leaves will be the same in *M. moniliforme* as it is in *M. clivorum*, *M. cognatum*, *M. proximum*, and *M. dissitum* described below, which takes place as follows:—During the summer the free tips of the pair of leaves that are united for a considerable or the greater part of their length into a cylindric or conical body terminating each branch gradually wither and dry up, and the skin of the united part also withers and becomes greyish, that part then assuming a more or less dried-up or dead appearance (really a resting condition), so that the plant appears leafless. Within this dead-looking terminal body, however, although quite invisible to any observer, a fresh growth is slowly developing, its formation taking place at the expense of the substance of the body enclosing it, so that finally it entirely replaces the latter, only the dried-up skin remaining and enveloping the new formation. Between October and February the dried skin ruptures and the new growth emerges from it, consisting of one pair of spreading or recurving leaves that are free except at the very base, and (or shortly followed by) another pair that are united for a considerable part of their length or nearly to their tips into a cylindric or conical body forming the termination of the stem or branch bearing it. Both pairs of leaves are minutely crystalline-papillate when young and remain green for some time, then they wither and the same process of renewal, as above described, takes place in due season.

From this it will be seen that if Haworth's statement of the sequence of development of the two pairs of leaves annually produced by *M. moniliforme* is correct, then in that species their order of production is exactly the reverse of that which occurs in *M. clivorum* and allies, which I place in the same section with *M. moniliforme*. All of these species are very remarkable in appearance.

M. CLIVORUM, *N. E. Br.* (Pl. **5.** figs. 5–8). Fruticulus succulentus 25–30 cm. altus. Caules 6–14 mm. crassi, rami 6–10 mm. crassi, teretes ad nodos constricti, internodiis 10–30 mm. longis, glabri, pallide cinerei, junioribus viridibus vel rubro-brunneis. Folia mollia, glabra, minutissime papillata, viridia vel rubescentia; alia e basi brevissime connato libera 2–5 cm. longa, basi 6–10 mm. lata et 6–8 mm. crassa, attenuata, subobtusa, supra canaliculata, subtus obtuse carinata; alia inferne in corpusculum cylindricum caule simillimum 2–3 cm. longum et 7–11 mm. crassum connata, apicibus liberis patulis vel recurvis 2½–5 cm. longis et 4–6 mm. latis et crassis ad apicem subobtusum leviter attenuatis supra leviter canaliculatis subtus obtuse carinatis. Flores ignoti.

A small succulent bush 25–30 cm. high in the plants seen. Main stems 6–14 mm. thick, branches 6–10 mm. thick, terete, usually with an annular constriction at the nodes, with internodes 1–3 cm. long, glabrous, at first green or reddish-brown, becoming pale grey with age. Leaves of two kinds, two pairs (one pair of each kind alternating) forming the growth of one year; soft and pulpy, glabrous, when young covered with minute green (not crystalline) glittering watery papillæ, which dry up with age, those on the keel at the apex larger than the rest, but quite obtuse, not at all pointed, of a rather dull dark green or reddish; one kind free except at the very base, where they are united for their own thickness (but not more) around the stem, widely recurved-spreading, 2–5 cm. long, 6–10 mm. broad and 6–8 mm. thick at the base, thence tapering to a subobtuse point, concave-channelled above, obtusely keeled beneath; the other kind united below into a cylindric body 2–3 cm. long and 7–11 mm. thick, similar to or scarcely distinguishable from the internode of stem separating it from the pair of leaves below it, with the terminal part of the leaves free, widely spreading or recurving, 2½–5 cm. long, 3½–6 mm. broad and as much in thickness at the base, very slightly tapering to a subobtuse point, slightly concave-channelled or flattish above, obtusely keeled beneath. Flowers unknown.

LITTLE NAMAQUALAND. Slopes of the pass between the Stinkfontein Plateau and Chubiessis, *Pearson*, 6200 !

Described from living plants collected and sent to Kew by Prof. H. H. W. Pearson in 1911. They have not yet flowered.

This species is allied to *M. cognatum* described below, and by reason of the constrictions at the nodes of its stems, leaves, and mode of growth is evidently closely related to *M. moniliforme*, Haw. on the one hand, and on the other to *M. mitratum*, Marl., *M. proximum*, and *M. dissitum* described here, so that the whole of these species belong to one and the same group.

M. COGNATUM, *N. E. Br.* (Pl. **7.** figs. 21–22). Fruticulus succulentus circa 15 cm. altus. Caules 8–10 mm. crassi, rami 6–7 mm. crassi, teretes ad nodos subincrassati, internodiis 5–25 mm. longis, glabri, pallide cinerei.

Folia mollia, glabra, juvenilia minute papillata, papillis secus margines et carinam acutis dentiformibus, viridia vel rubescentia ; alia 1½–3½ cm. longa, basi 6–8 mm. lata et 3–4 mm. crassa, attenuata, subacuta, trigona, supra leviter canaliculata vel subplana, subtus obtuse carinata, recurvo-patula, basi in vaginam 5–8 mm. longam connata ; alia inferne in corpusculum cylindricum caule simillimum 1½–2½ cm. longum et 5–7 mm. crassum connata, superne libera, patula, 18–32 mm. longa, 4–5½ mm. lata et 3½–5 mm. crassa, sublinearia, obtusa, trigona, supra leviter canaliculata vel subplana, subtus obtuse carinata. Flores ignoti.

A dwarf succulent bush about 15 cm. high in the plant seen. Main stems 8–10 mm. and the branches 6–7 mm. thick, terete, with internodes 5–25 mm. long and the nodes usually slightly thickened, glabrous, pale grey. Leaves of two kinds, a pair of each kind alternating with one another and the two pairs forming the growth of one year, soft and pulpy, glabrous, when young minutely crystalline-papillate, with the papillæ on the margins and keel acute, tooth-like, drying up and disappearing with age, green or tinted with reddish ; one kind connate only at their base for more than their own thickness into a short sheath 5–8 mm. long, recurved-spreading, 1½–3½ cm. long, 6–8 mm. broad and 3–4 mm. thick at the base, thence gradually tapering to a subacute point, slightly concave-channelled or flattish above, obtusely keeled beneath ; the other kind united below into a cylindric body 1½–2½ cm. long and 5–7 mm. thick, scarcely distinguishable from the stem except in colour, supported on an internode that frequently does not exceed in length the sheath formed by the pair of leaves at its base, with the free tips widely spreading, 18–32 mm. long, 4–5½ mm. broad and 3½–5 mm. thick, linear-trigonous, of nearly equal breadth throughout, obtuse, slightly concave-channelled or flattish above, obtusely keeled beneath. Flowers unknown.

LITTLE NAMAQUALAND. On the upper slopes of hills south-west of Chubiessis, *Pearson*, 6179 !

Described from living plants sent by Prof. H. H. W. Pearson to Kew in 1911, which have not yet flowered.

M. cognatum is closely allied to *M. clivorum*, but it appears to be a dwarfer plant, and is easily distinguished by its less stout stems, which are thickened at the nodes instead of being constricted there ; its leaves are smaller, and distinctly united at their base into a cup-shaped sheath a little longer than their own thickness, which is not the case in *M. clivorum* ; they are of a rather lighter green, with the papillæ on them more crystalline, and those on the margins and keel acute and tooth-like, instead of very obtuse.

M. DISSITUM, *N. E. Br.* (Pl. **5**. fig. 9 & Pl. **6**. fig. 11). Suffrutex succulentus ad 30 cm. altus. Caules senecti 3–5 mm. crassi, sordide violaceo-grisei ; rami 3 mm. crassi, internodiis 2½–6½ cm. longis, glabri,

rubro-brunnei. Folia biformia, glabra, viridia vel rubro-tincta; altera fere libera, basi tantum connata, patula, 2–4½ cm. longa, basi 8–11 mm. lata, deinde attenuata, acuta, supra plana vel leviter concava, subtus obtuse carinata; altera partibus inferioribus in conum longe stipitatum 2½–4½ cm. longum et 7–10 mm. crassum connata, apicibus liberis erectis vel adscendentibus 1–3 cm. longis 4–6 mm. latis et 3–5 mm. crassis obtuse trigonis acutis supra planis. Flores ignoti.

A small succulent bush up to 30 cm. high under cultivation. Old stems 3–5 mm. and branches 3 mm. thick, terete, slightly thickened at the nodes, with the rather slender internodes 2½–6½ cm. long, glabrous, at first reddish-brown, changing to a dark and slightly violaceous grey. Leaves of two kinds, a pair of one kind alternating with and separated by a long internode from a pair of another kind, the two pairs usually forming one season's growth, soft and pulpy, glabrous, but in their earliest stage minutely crystalline-papillate, especially at the tips, and with minute acute tooth-like papillæ along the margins, which after a time disappear, green or reddish, or green with reddish tips; one kind free except at the very base, where they unite around the stem, widely spreading, 2–4½ cm. long, 8–11 mm. broad at the base, thence tapering to an acute apex, flat or slightly concave above, obtusely keeled on the rounded back; the other kind united throughout the greater part of their length into a conical fleshy body 2½–4½ cm. long and 7–10 mm. thick at the base, tapering to a thickness of 4–7 mm. at the top, with free erect or slightly spreading trigonous tips 10–26 mm. long, 4–6 mm. broad and 3–5 mm. thick at the base, thence slightly tapering to an acute apex, flat above, obtusely keeled on the back. Flowers unknown.

LITTLE NAMAQUALAND. Among bushes on the upper slopes of hills above Daunabis, *Pearson*, 6116!

Described from living plants sent to Kew in 1911, which have not yet flowered.

This species, although allied to *M. mitratum* and *M. proximum*, is well distinguished from them by the long slender internodes separating the pair of free leaves from those united into a cone. These three species are distinguished from all others in the genus by the peculiar cone-shaped body which terminates the growth of each year. Nevertheless, they cannot be disassociated from the section *Moniliformia*, because in all other characters they conform with those of that section, and if the bodies were spherical instead of conical there would be no character whatever to distinguish them. The true position of this remarkable section *Moniliformia* is that it is related on the one hand to the section *Sphæroidea* and on the other to the section *Rostrata*. In my opinion it should be placed next to the latter.

M. MITRATUM, *Marl.* (Pl. **5.** figs. 1 & 2). A shrublet about 30–60 cm. high. Branches erect, 7–15 mm. thick, with ring-like thickenings at the nodes, dark reddish when young, becoming dark brown. Leaves of two kinds; one kind free except at the very base, where they are united around the stem, evidently spreading, but they are not described and only their withered remains are represented in Dr. Marloth's figure; the other kind united for the greater part of their length into a fleshy conical body 3–6 cm. long and 18–25 mm. thick, terminating each branch. Flowers bursting through the dried-up skin at the side of the conical body. Peduncle about 1 cm. long. Calyx 5-lobed, 3 of the lobes with membranous margins. Petals apparently about 1 cm. long, linear, white at the base, pale pink at the upper part.—*M. mitratum*, Marl. in Tr. Roy. Soc. S. Afr. vol. ii. p. 35, pl. 1. fig. 4 (1910), & Fl. South Afr. vol. i. p. 205, pl. 51. fig. C.

LITTLE NAMAQUALAND. Sandy deserts about 10 miles east of Port Nolloth, *Alston* in *Herb. Marloth*, 4690.

The above description is compiled from that given by Dr. Marloth and from his figures of the plant, partly copied on Pl. **5.** figs. 1–2. He appears not to have seen the plant in a vegetative condition, as he does not describe both kinds of leaves, nor if they are or are not crystalline-papillate when young. The mode of growth is undoubtedly the same as that of *M. proximum*, *M. dissitum*, etc., which I describe on p. 59, and not quite the same as detailed by Dr. Marloth. I have included this species here to contrast it with *M. proximum*, from which *M. mitratum* seems to differ by its much stouter conical bodies, which are also solitary instead of clustered.

Dr. Marloth has placed this plant in a separate section (§ *Mitrata*), but as *M. mitratum*, *M. proximum*, and *M. dissitum*, which are certainly all allied, do not differ in any way in their very peculiar mode of growth from *M. clivorum* and *M. cognatum* described here, all of these species must be associated under one group or section; and as there is evidently a relationship between *M. clivorum* and *M. moniliforme*, as indicated by some of the branches on the plants of *M. clivorum*, one of which I have represented on Pl. **5**, where the internodes are much shorter than usual, so that they then somewhat resemble the bead-like joints of *M. moniliforme*, it appears to me that all these plants should be placed under the section *Moniliformia* of Haworth, as I have here done.

M. MONILIFORME, *Thunb.* (Pl. **5.** fig. 10). Plant 3–4 inches (7½–10 cm.) high, branching. Stems or branches 4–6 lines (8–12 mm.) in diameter, beaded or necklace-like from being constricted at the nodes into depressed-globose segments, brown. Leaves of two kinds, one pair of each kind (*i. e.* 4 leaves) produced annually at the end of each stem or branch; one kind 4–6 inches (10–15 cm.) long, linear-semicylindric, obtuse, recurving, soft, minutely pubescent according to Thunberg, but probably minutely crystalline-papillate, united at the base for about half an inch (12 mm.) into a globose body, green; the other kind united nearly to the tips into a fleshy oblong sphæroid body. Peduncle solitary, terminal, 2 inches (5 cm.) long, cylindric (angular according to Thunberg), crystalline-papillate. Calyx deeply 4-lobed, the smaller lobes with membranous margins. Petals numerous, a little longer than the calyx-lobes, linear, entire, subobtuse, white. Stamens numerous, spreading ; filaments and anthers yellow. Stigmas 7, as long as the stamens, spreading, greenish-yellow.—*M. moniliforme*, Thunb. in Nov. Act. Ephem. Nat. Curios, vol. viii. Append. p. 7 (1791) ; & Fl. Cap. ed. Schultes, p. 413 : Haw. Obs. pp. 132, 440, & 441 ; Misc. p. 24 ; Synop. p. 207 ; & Rev. p. 93.

VAN RHYNSDORP DIV. On hills near the Olifants River, towards the North, *Thunberg*, *Masson*.

As this species seems to be very imperfectly known, the above description is compiled from those of Thunberg and Haworth and from what I remember of a plant of this species cultivated many years ago in Kew Gardens (see p. 112), but of which I made no notes. My figure of it is made partly from a small, imperfect, and very crude sketch I made of a part of the plant at Kew and partly from memory, but although not accurate, it is sufficiently correct to give some idea of what this very remarkable species looks like.

M. PROXIMUM, *N. E. Br.* (Pl. **5**. figs. 3 & 4). Suffrutex succulentus 20–25 cm. altus, ramosus. Caules usque ad 6 mm. crassi, rami 4–5 mm. crassi, teretes, nodis leviter incrassatis et internodiis 6–25 mm. longis, glabri, pulluli. Folia biformia glabra viridia ; altera fere libera basi tantum connata, patula, 1½–8 cm. longa, 8–14 mm. lata, basi 6–8 mm. crassa, attenuata acuta, supra plana, subtus convexa, apice breviter carinata ; altera partibus inferioribus in conum sæpe subsessilem 3–7½ cm. longum et 10–18 mm. crassum connata, apicibus liberis patulis 8–25 mm. longis. Flores ignoti.

A small succulent bush 20–25 cm. high under cultivation. Old stems about 6 mm. thick, branches about 4–5 mm. thick, terete, slightly thickened at the nodes, with internodes 6–25 mm. long, glabrous, dark violaceous grey. Leaves of two kinds, a pair of one kind alternating with a pair of another kind, the two pairs usually forming the growth of one season, soft and pulpy, glabrous, but in their earliest stage minutely crystalline-papillate, especially at the tips, and with minute acute tooth-like papillæ along the margins, which afterwards disappear, uniformly light green ; one kind free except at the very base, where they unite around the stem, widely spreading, 1½–8 cm. long, 8–14 mm. broad, and 6–8 mm. thick at the base, thence gradually tapering to an acute or subacute apex, concave, flat, or sometimes at length slightly convex on the face, obtusely keeled on the back ; the other kind united throughout the greater part of their length into a stout conical fleshy body, sometimes supported on a short internode, sometimes sessile or subsessile, 3–7½ cm. long, 10–18 mm. thick at the lower part, tapering to 6–8 mm. thick at the top when fully developed, with free ascending or diverging tips 8–25 mm. long, 2–6 mm. broad and 2–4 mm. thick at the base, thence tapering to an acute or subacute apex, at first concave, becoming flat above, obtusely keeled on the back. Flowers unknown.

LITTLE NAMAQUALAND. Without precise locality, *Pearson*!

Described from living plants sent to Kew by Prof. Pearson with *M. dissitum* in 1911, so that it may perhaps have come from the same neighbourhood.

M. proximum is undoubtedly closely allied to *M. mitratum*, Marl., but distinctly differs from that species by the tendency of the plant to produce its conical growths or cones in clusters, and by the cones themselves being more elongated and not nearly so thick; the flowers may also differ, but it has not yet flowered in this country. (See also p. 58.)

From *M. dissitum* the short internodes and different colour of the much stouter stem at once distinguishes this species.

§ MURICATA.

M. DELTOIDES, *Linn.* There is considerable confusion both in books and gardens concerning this plant, because Haworth changed the name of the typical plant to that of *M. muricatum* and preserved the name *M. deltoides* for a large-flowered variety of it. In gardens three distinct forms of this species are cultivated under various names, which may be recognized by the following characters and revised synonymy:—

M. DELTOIDES, Linn. Peduncle not or scarcely exceeding the leaves, 2–12 mm. long, with a pair of bracts at the middle. Corolla 10–12 mm. in diameter.—*M. deltoides,* Linn. Sp. Pl. ed. 1, p. 482 (1763): Miller, Dict. ed. 8, no. 11 (not 13 as quoted by authors): Haw. Obs. p. 364. *M. deltoides* var. *muricatum*, Berger, Mesemb. p. 190. *M. muricatum,* Haw. Misc. p. 75 (1803): Salm-Dyck, Mesemb. § 30, fig. 3: Sonder in Fl. Cap. vol. ii. p. 421. *M. deltoides et dorso et lateribus muricatis minus,* Dillen. Hort. Elth. p. 255, t. 195. fig. 246 (1732).

Var. MAJUS, Weston. Peduncle not or scarcely exceeding the leaves, 2–12 mm. long, with a pair of bracts at the middle. Corolla about 18 mm. in diameter.—*M. deltoides* var. *majus,* Weston, Univers. Bot. vol. i. p. 169 (1770): Haw. Obs. p. 366. *M. deltoides* var. *β*, Linn. Sp. Pl. ed. 1, p. 482 (1763). *M. deltoides,* DC. Pl. Grass. t. 53: Haw. Misc. p. 74, not of Linnæus. *M. deltoides et dorso et lateribus muricatis majus,* Dillen. Hort. Elth. p. 254, t. 196 as to fig. 247 only.

Var. PEDUNCULATUM, N. E. Br. Peduncle much longer than the leaves, 25–50 mm. long, with a pair of bracts at the middle. Flower 18–22 mm. in diameter.—*M. deltoides*, Salm-Dyck, Mesemb. § 30, fig. 2: Sonder in Fl. Cap. vol. ii. p. 421: Berger, Mesemb. p. 190, not of Linn. *M. deltoides et dorso et lateribus muricatis majus,* Dillen. Hort. Elth. p. 254, as to t. 195. fig. 245 only.

Tulbagh Div. New Kloof, near Tulbagh, *MacOwan* ! *Schlechter*, 9045 ! *Scott Elliot*, 228 ! near Tulbagh Waterfall, *Bolus*, 5054 ! All three varieties were introduced before 1732.

It is difficult to distinguish the varieties from dried material, but I believe Bolus, 5054 represents the typical form and MacOwan's specimen the variety *majus*.

§ PARIFERA.

M. binum, *N. E. Br.* (Pl. **10**. figs. 41–42). Suffrutex circa 10–15 cm. altus, cruciatim ramosus. Rami ancipiti, internodiis 10–18 mm. longis. Folia 10–18 mm. longa, 5–9 mm. lata et 8–10 mm. crassa, adscendentia, ad medium connata, compressa, trigona, supra leviter convexa, dorso acute carinata, e latere visu semilunata, subacuta, apiculata, microscopice puberula, subcæruleo-viridia, purpureo-carinata. Flores non vidi, sed ex icone corolla 28–30 mm. diametro ; petala circa 30, libera, 12–13 mm. longa et 2½–3 mm. lata, lineari-oblanceolata, obtusa. Stamina collecta, 6 mm. longa.

A dwarf shrublet, apparently about 10–15 cm. high, branching in a cruciate manner. Stem slightly compressed and 2-edged, about 4 mm. thick in one direction and 3 mm thick in the other, with internodes 10–18 mm. long, at first green, becoming brown and woody with age ; branches spreading 4–7 cm. long in the specimens seen. Leaves 10–18 mm. long (measured from the base at the back), 5–9 mm. broad and 8–10 mm. thick, laterally compressed, ascending or ascending-spreading and united at the base for 7–9 mm. of their total length, each leaf viewed from the side being somewhat half-moon-shaped, subacute or obtuse and minutely apiculate at the apex, slightly convex or flattish on the upper surface, and viewed from above elongated triangular or ovate in outline, acute, acutely keeled all down the back, and with the keel continuing down the stem ; surface smooth, microscopically puberulous, velvety to the touch, faintly bluish-green, dull purplish or reddish along the cartilaginous keel, not dotted. Flowers not seen, but according to a photograph representing a small plant of the natural size, the corolla is 28–30 mm. in diameter, with about 30 petals free to the base, 12–13 mm. long and 2½–3 mm. broad, linear-oblanceolate, obtuse. Stamens numerous, collected into a bundle 6 mm. long, apparently of a dark colour at the tips.

Laingsburg Div. Near Matjesfontein, *Pillans* !

This species is very singular in appearance and quite distinct from all that are known to me. The soft fleshy compressed leaves, being united in pairs for about half their length into flattened obovate 2-lobed bodies, suggest a process of evolution where species of the type of *M. bilobum* have developed internodes between the successive growths and so developed into a shrublet. The oblique stripes on the leaves are not evident to all seasons of the year.

§ PLANIFOLIA.

M. oculatum, *N. E. Br.* When I described this species in the Kew Bulletin, 1911, p. 313, I stated that it was allied to *M. viridiflorum*, Ait., but at that time the plant was in vigorous growth and did not show its real character, for I have since found that its leaves wither, persist and become somewhat skeleton-like in the same way that those of *M. anatomicum*, Haw. do. Therefore, although its leaves are not flat, I think it should be placed in the same group as the latter species.

Little Namaqualand. Between quartzite ledges on the upper north-western slopes of hills south-west of Chubiessis, *Pearson*, 6172!

The flattish papillæ on the leaves of this species are very large and are arranged in longitudinal rows.

§ SARMENTOSA.

M. Schollii, *Salm-Dyck.* The validity of this name to stand for this species rests upon whether the imperfectly known *M. recurvum*, Moench (see p. 123), which was published in 1802, is identical with any species published before Haworth's 'Miscellanea Naturalia' appeared in 1803. For if *M. recurvum*, Moench proves to be a synonym of any previously described species, as I suspect it will, then the name *M. recurvum*, Haw. must replace that of *M. Schollii*, the following being the dates and particulars of the nomenclature:—

> M. recurvum, Haw. Suppl. p. 90 (1819).—This name was given to the plant described and figured under the name of *M. aduncum* by Jacquin in his 'Fragmenta Botanica,' p. 43, t. 51. fig. 2, because Haworth had already published in 1803 (Misc. p. 87) another species under the name of *M. aduncum*, and so was justified in giving a fresh name to Jacquin's plant. Jacquin's 'Fragmenta' is dated 1809, but it was issued in six parts between 1800 and 1809. I have failed to discover when each part was published, but there is internal evidence that gives a clue to a date before which certain pages could not have been published. Thus, from the evidence given on p. 40 under *Eugenia balsamica*, it is clear that p. 43 and accompanying plates could not have been published until or after the year 1804, which is one year later than the date of *M. aduncum*, Haw.
>
> M. Schollii, Salm-Dyck, Obs. Bot. p. 10 (1820). At this place Salm-Dyck quotes *M. recurvum*, Haw. and *M. aduncum*, Jacq. as synonyms.

South Africa. Locality unknown, raised from seeds, which were probably sent by *Scholl.*

M. VALIDUM, *Haw.* Branches stout, rigid, decumbent. Leaves long, pale green, with a rough margin. Flowers subternate, with the keels of the bracts entire. Petals rosy, with a red mid-line.—*M. validum*, Haw. in Phil. Mag. 1826, p. 329.

SOUTH AFRICA. Locality unknown, introduced by *Bowie.*

This species is entirely omitted from the monograph of Sonder and of Berger, because they have both copied the unaccountable error made by Salm-Dyck, who figured and described a totally different plant with solitary yellow flowers as being the *M. validum* of Haworth, which, although there is not a drawing of it at Kew, is evidently, as Haworth states, closely allied to *M. rigidicaule*, Haw. and not in the least like the plant figured and described by Salm-Dyck, Sonder, and Berger under that name (see *M. dissimile,* N. E. Br., p. 105). In comparing *M. validum* with *M. rigidicaule*, Haworth states that it differs in having shorter, more contiguous and more erect branches, paler leaves that are always shorter (not sometimes longer) than the internodes, entire bracts not lacerate on the back, and fewer, less pedunculate flowers.

§ SPINULIFERA.

M. VIGILANS, *L. Bolus.* Mrs. Bolus desires that the above name should replace that of *M. hesperanthum* for the Bechuanaland plant described by her in 1915 under that name, because the same name had been used by Dinter and Berger in 1914 for a very different species belonging to the section *Dolabrifolia.* Therefore its synonymy will be :—*M. vigilans,* L. Bolus. *M. hesperanthum,* L. Bolus in Ann. Bolus Herb. vol. i. p. 190 (1915), not of Dinter and Berger.

BECHUANALAND. Gaberones, *Rogers.*

§ TRICHOTOMA.

M. MACRORHIZUM, *Haw.* This name was published by Haworth in 1826, and was changed to *M. megarhizum* by Don in 1834, because another species had been described by De Candolle under the name of *M. macrorhizum*, and all authors have subsequently upheld Don's name. But Haworth's name was published two years earlier than that of De Candolle, and therefore must be restored and another name given to the plant described by De Candolle as *M. macrorhizum*, for which I propose that of *M. napiforme*, N. E. Br., see p. 110.

The synonymy of Haworth's plant will therefore be as follows :—*M. macrorhizum* Haw. in Phil. Mag. 1826, p. 331 : Salm-Dyck, Mesemb. § 49, fig. 3. *M. megarhizum*, Don, Gen. Syst. vol. iii. p. 145 (1834) : Sonder in Fl. Cap. vol. ii. p. 441 : Berger, Mesemb. p. 101.

Cape Div. The locality from which this plant was originally introduced by *Bowie* is unknown, but *Schlechter's* no. 7546, collected on Lion Mountain near Cape Town, appears to be this species.

§ TUMIDULA.

M. festivum, *N. E. Br.* Frutex ultra 30 cm. altus. Caules erecti, 3–4 mm. crassi, internodiis 3–8 cm. longis. Folia axillaria tantum vidi, suberecta, 3 cm. longa, semiteretia, acuta, apice recurva, glabra, glauca? Cymæ 5–7 cm. diametro, 10–20-floræ, ramis 4–8 cm. longis suberectis. Bracteæ 7–15 mm. longæ, late deltoideæ, acutæ, subpatulæ, cupulato-connatæ. Pedicelli 10–12 mm. longi. Calyx 6-lobus; lobi 5–7 mm. longi, 4–5 mm. lati, deltoideo-ovati, acuti vel dorso apiculati, membranaceo-marginati. Petala numerosissima, 6–10 mm. longa, $\frac{1}{3}$–$\frac{1}{2}$ mm. lata, linearia, acuta, interioria filiformia. Stamina 30–40?, circa 2–3 mm. longa. Stigmata 5, parva, crassa, acuta, 1 mm. longa.

A shrub over 30 cm. high. Main stems or branches with internodes 3–8 cm. long and 3–4 mm. thick, branching into cymes at the top, brown, gland-dotted on the young parts. Leaves of the main stems fallen, only seen in the axillary tufts, erect or suberect, 3 cm. long and $1\frac{1}{2}$ mm. thick (dried), apparently semiterete and of about the same breadth and thickness throughout, flat or concave above and rounded or obtusely keeled on the back, acute and recurved at the tips, probably smooth and glaucous-green. Cymes 5–7 cm. in diameter, 10–20-flowered, with the flowers all nearly at the same level, its branches 4–8 cm. long, suberect. Bracts 7–15 mm. long, broadly deltoid-ovate, acute, ascending, spreading, united at the base into a cup-like sheath, the upper with membranous margins. Pedicels 10–13 mm. long. Calyx 6-lobed, glabrous, gland-dotted in the dried state; tube at the base of the lobes 6–8 mm. in diameter; lobes 5–7 mm. long, 4–5 mm. broad, deltoid-ovate or ovate, with membranous margins, acute or with a dorsal point 1–2 mm. long just below the apex. Corolla probably 25 mm. or more in diameter; petals very numerous, 6–10 mm. long, $\frac{1}{3}$–$\frac{1}{2}$ mm. broad, narrowly linear, acute, the inner (or possibly these may be barren stamens) filiform, all gland-dotted (dried). Stamens apparently about 30–40, not very numerous in proportion to the number of petals (unless the supposed inner petals are antherless stamens), about 2–3 mm. long. Stigmas 5 in the only flower examined, 1 mm. long, stout, erect, with recurved acute tips.—*M. tumidulum*, Sonder in Fl. Cap. vol. ii. p. 426: Berger, Mesemb. p. 114 (partly), not of Haworth.

Van Rhynsdorp Div. Driefontein, *Zeyher*, 698!

This is the plant Sonder has described as being *M. tumidulum*, but it is entirely different from that species in habit, number of flowers in a cyme, and much larger size of the flowers etc., and comes from a totally different region. All the measurements in the above description are made from dried specimens, so that probably some of them will be found to be less than those of the same parts of the living plant.

Affinity doubtful.

M. RECURVUM, *Moench.* A decumbent shrub with a glabrous bark. Leaves 6 lines (12 mm.) long, subtriquetrous, connate-sessile, recurved at the apex, glabrous, subpapillose. Flowers solitary, white. Bracts none. Calyx 5-lobed. Stamens all fertile. Stigmas 5. Capsule 5-celled.—*M. recurvum*, Moench, Meth. Pl. Suppl. p. 190 (1802), not of Haworth.

Locality and collector unknown, but probably of South African origin.

The above is a translation of the original description, which represents all that is known of this plant. It appears to have been overlooked by all authors, as I have failed to find it in the works of either Haworth, De Candolle, Sonder, or Berger ; but it is quite probable that it has been also described by Haworth under another name. The section to which it belongs is doubtful. The *M. recurvum*, Haw. was not published until 1819 (see under *M. Schollii*, p. 120).

III. Species discovered by Burchell. (To end.)

M. ALOIDES, *Haw.* (§ Aloides). Stemless, tufted, with fusiform roots. Leaves numerous, spreading, scarcely regularly decussate, semicylindric, thick, gradually enlarged upwards, somewhat concave on the upper side, carinate-triquetrous at the apex, entire, greenish, with somewhat pearl-like white dots, especially beneath. Flowers central, sessile, of moderate size, yellow, produced in the autumn.

The above are all the characters given by Haworth in his two descriptions of this plant. Burchell in his MSS. describes it as follows :—" Stemless ; roots fusiform, edible. Leaves spathulate, connate at the base, entire, acute, flat above, convex beneath, twice as broad as thick, dull green sprinkled with white dots. Flower sessile, yellow."

In the Kew Herbarium is preserved an excellent coloured drawing of the typical plant, inscribed "*M. aloides*, Haw. Received from Mr. Haworth in the year 1822, who obtained it from Mr. Burchell." This drawing shows the following characters :—Plant stemless, tufted. Leaves 8–12 to a growth or cluster, some perhaps belong to axillary growths, widely spreading, opposite, but forming a rosette 6–7 cm. in diameter ; each leaf 2–3 cm. long, 8–10 mm. broad, and about 5 mm. thick, lanceolate or somewhat rhomboid-lanceolate, acute, flat, or perhaps slightly concave above, keeled beneath, at least at the apical part, rather dark dull green, with purplish margins, thickly dotted with white on both surfaces, the dots along the margins crowded and almost touching one another. Flower sessile. Calyx not represented. Corolla 25 mm. in diameter; petals in about 2 series, widely spreading, the outer about 10 mm. long and 1 mm. broad, the inner a little shorter, linear, acute, yellow, with red tips. Stamens numerous, collected into a cone about 6 mm. broad at the base and 3 mm. broad at the apex; filaments white, anthers dull purplish.—*M. aloides*, Haw. Suppl. p. 88 (1819); & Rev. p. 87: Burch. Trav. vol. ii. p. 332: DC. Prodr. vol. iii. p. 419, not of Salm-Dyck, Sonder, or Berger.

BECHUANALAND. At Matlowing River, July 7, 1812, *Burchell*, 2197, and at Jabiru Fontein, near Takun, Aug. 31 and Sept. 5, 1812, *Burchell*, 2249–8.

I have given the above three descriptions of this species in order to call attention to it, for at present it is quite an unknown plant, as that figured by Salm-Dyck and described in modern books as being *M. aloides* is not that species at all (see *M. cibdelum*, N. E. Br., p. 64).

In gardens two or three species are cultivated under the name of *M. aloides*, but none are correctly named. The only species that I have seen which bears any resemblance to the true *M. aloides* is *M. rubrolineatum*, N. E. Br., which is very similar in its habits and foliage. But the latter species comes from the widely distant locality of the Graaff Reinet region and has different flowers, the red midribs of its petals being very distinctive.

Burchell states in his 'Travels' that the roots are "eaten by the natives as a substitute for better food." Of no. 2197 he collected only seeds, but of nos. 2249–8 he collected both seeds and a dried specimen, which latter was in his herbarium when it came to Kew, but according to the list made, was not mounted for Kew, but treated as a duplicate, so that the type is probably in the Asa Gray Herbarium at Harvard University, Cambridge, Mass., U.S.A.

M. ARBORIFORME, *Burch.* (§ Spinosa). A small shrub 1–2 feet high, branched, and mostly with a simple trunk. Cymes 8-times forked. Flowers minute, of a testaceous colour.

The above is a translation of the original description. The following I have made from the dried type specimen:—

A shrublet, densely and alternately much branched so as to form a mass of small dead rigid and somewhat spiny cymes. Main branches woody, 4–5 mm. thick, with internodes 5–15 mm. long; bark smooth, dark brown. Young flowering branches alternate, at first appearing to be 1–5 cm. long below the first forking of the cyme, but sometimes by the development of fresh cyme-branches from its nodes, the ultimate length below an old cyme is often only 5–15 mm., about 1½–2 mm. thick, with internodes 5–15 long, papillose, whitish. Leaves opposite, contiguous but (on dried specimens) scarcely connate at the base, spreading, 5–15 mm. long, 1–1½ mm. thick, doubtless larger when alive, when swollen in boiling water appearing semiterete, or slightly convex or slightly channelled above and convex beneath, but some appear as if they may have been obtusely keeled, obtuse, apparently smooth. Primary cymes 3–6 cm. in diameter, many-flowered, 3–6-times forked, but by the development of fresh cymes from the lower part of an old one the ultimate cyme formed of dead and living cymes becomes up to 8-times forked, as Burchell states. By the branching from the lower part of each old cyme and one of the branches thickening and becoming stem-like a thick mass of branches and dead cymes is formed. Bracts like reduced leaves, 2–5 mm. long. Pedicels $1\frac{1}{2}$–4 mm. long. Calyx 5-lobed; lobes 1–2 mm. long, unequal, 3 with membranous margins. Corolla 7–10 mm. in diameter; petals apparently about 20–25 but perhaps up to 30, in 1–2 series, about 3–$4\frac{1}{2}$ mm. long and $\frac{2}{3}$–$\frac{3}{4}$ mm. broad, linear, obtuse. Stamens numerous, apparently not collected into a column or cone, $1\frac{1}{2}$–2 mm. long. Stigmas apparently 4–5, partly destroyed in the flowers examined, nearly 1 mm. long, subulute, with recurving tips.—*M. arboriforme*, Burch. Trav. vol. i. p. 343 (1822): DC. Prodr. vol. iii. p. 451: Sonder in Fl. Cap. vol. ii. p. 459: Berger, Mesemb. p. 292.

GRIQUALAND WEST. Hay Div., between Wittewater and Rietfontein, Feb. 15, 1812, *Burchell*, 2004! This is the type, but what appears to be the same species was also collected in Philipstown Div., near Petrusville, on March 2, 1813, *Burchell*, 2681! Also collected near the Diamond Fields by *Dr. Shaw*, 14!

Burchell collected only four small branches of no. 2004 and one larger branch of 2681, from which the above description is made; all are at Kew. Burchell places this species in the alliance of *M. parviflorum*, Haw., but it is evidently nearly allied to *M. spinosum*, which, as understood by South African botanists, includes 3 or 4 distinct species, and, I believe, *M. arboriforme* among others.

M. BIDENTATUM, *Haw.* (§ Difformia). This specimen was described from plants raised from seeds collected by Burchell, who preserved no specimen of it, either of the South African plant or that grown in England. But it is well known, and there is an original coloured drawing of the type at Kew. I cannot find any clue as to the locality where Burchell collected it.—*M. bidentatum*, Haw. Suppl. p. 89 (1819); & Rev. p. 103: DC. Prodr. vol. iii. p. 423: Salm-Dyck, Mesemb. § 7, fig. 1: Sonder in Fl. Cap. vol. ii. p. 400: Berger, Mesemb. p. 231.

M. BLANDUM, *Haw.* (=*M. multiradiatum*, Jacq.). (§ Blanda.) This species is well known and commonly cultivated at the present time. The name, however, should give place to that of *M. multiradiatum*, Jacq., which antedates it by more than ten years; the correct synonymy being:—*M. multiradiatum*, Jacq. Fragm. p. 44, t. 53. fig. 1 (between 1804 & 1807). *M. blandum*, Haw. Suppl. p. 95 (1819); & Rev. p. 147: DC. Prodr. vol. iii. p. 436: Lodd.

Bot. Cab. t. 599: Lindl. Bot. Reg. t. 582: Salm-Dyck, Mesemb. § 26, fig. 1: Sonder in Fl. Cap. vol. ii. p. 418: Berger, Mesemb. p. 162.

BATHURST DIV. Near Barville Park, Oct. 14, 1813, *Burchell*, specimens raised from seed of no. 4125!

Salm-Dyck and others following him, without investigation, have wrongly placed *M. multiradiatum*, Jacq. as a synonym of *M. roseum*, Willd.

A drawing of the typical plant of *M. blandum* is preserved at Kew. The figures in the 'Botanical Cabinet' and 'Botanical Register' are excellent, that of Salm-Dyck rather poor, representing a "drawn up" plant.

M. BREVICAULE, *Haw.* (§ Capitata). Seeds only of this species were collected in South Africa, from which living plants were raised in England, but no specimen of them was preserved by Burchell. A coloured drawing of the type plant is preserved at Kew, which seems to be the same as that figured by Salm-Dyck, so that it is correctly understood in modern works.—*M. brevicaule*, Haw. Suppl. p. 91 (1819): & Rev. p. 113: DC. Prodr. vol. iii. p. 426: Salm-Dyck, Mesemb. § 16, fig. 2: Sonder in Fl. Cap. vol. ii. p. 409: Berger, Mesemb. p. 216.

SOUTH AFRICA. Collected during a journey made between the Vaal River and Graaff Reinet, March to May 1812, *Burchell*, 2128–2! (Seed 111).

M. CAMPESTRE, *Burch.* (§ Vaginata). An erect shrub about 1½ ft. high. Branches (dried) 2–3 mm. thick, bearing short branchlets 8–28 mm. long, from one axil only of the leaf-pairs and directed to one side of the branch; internodes 5–10 mm. long; bark grey. Leaves ascending or ascending-spreading, 6–10 mm. long, 2½–3½ mm. broad and 2–2½ mm. thick at the base, thence tapering in a nearly straight line to an acute apex, which bears a small recurved-hooked point, slightly concave (or when alive perhaps flat) on the upper side, obtusely keeled on the rounded back, united at the base into a sheath 3–6 mm. long, glabrous, apparently not serrulate on the keel. Flowers solitary, terminating the short lateral branchlets. Pedicels shorter than the leaves, 3–5 mm. long. Calyx 5-lobed; tube or ovary very shortly and broadly obconic; lobes 4–5 mm. long and 2–3 mm. broad, deltoid-ovate, acute. Petals rosy, according to Burchell, but these and the other parts of the flower are not present on the specimens, there being only one imperfect flower and two immature capsules on the Kew specimens.—*M. campestre*, Burch. Trav. vol. i. pp. 259–260 (1822): DC. Prodr. vol. iii. p. 451: Sonder in Fl. Cap. vol. ii. p. 459: Berger, Mesemb. p. 292.

SUTHERLAND DIV. Near Sutherland, Aug. 8, 1811, *Burchell*, 1340!

Burchell states that "*M. campestre*, now in bloom, everywhere decorates the road." So that it must be plentiful in the locality where he found it. He only collected three specimens of this species, two of which are at Kew and the other is probably in the Asa Gray Herbarium at Harvard University, United States, where the first set of duplicates of Burchell's plants were sent.

Burchell has stated that it is "allied to *M. pulchellum*, Haw." But this is quite a mistake, for it belongs to the very different section *Vaginata*, and is very similar to *M. parviflorum*, Haw., having the same stout branches and the same hooked apiculus to the leaves, which are also similar in pose and shape, but the flowers are rosy instead of white, and I do not detect any minute serrulation on the keel of the leaves such as is characteristic of *M. parviflorum*, Haw. Berger has wrongly placed *M. parviflorum* as a synonym of *rigidum*, Haw., but the latter has more slender branches and its leaves are more spreading, less stout, and without the hooked apiculus at their tips, whilst the flowers of *M. rigidum* are 12–14 mm. in diameter and those of *M parviflorum* only 6–8 mm. The dried leaves of *M. campestre* are remarkably wrinkled, so that they are probably larger than the dimensions above given both in length and thickness.

M. CORIARIUM, *Burch.* (§ Vaginata). A shrub or shrublet. The type specimen consists of a single piece, branching so as to form a pyramidal panicle about 27 cm. long and 18 cm. broad, with numerous cymes, appearing leafless in the dried state. Main stem 4 mm. thick, probably stouter when alive, with internodes 1½–2 cm. long, distinctly tuberculate, and rough to the touch, but possibly through shrinkage in drying, light brown; branches alternate, the lower about 10 cm. long, the upper gradually shorter, very spreading, straight or slightly recurving, about 3 mm. thick, with internodes 8–15 mm. long, the lower with 2–3 (the upper with fewer) alternate branchlets 5–20 mm. long, bearing cymes of apparently 5–12 flowers, the cymes of each branch collectively forming an apparently one-sided compound cyme 2½–4 cm. broad. Leaves opposite, very small, 1–1½ mm. long and about as broad, ½ mm. thick at the base, resembling flat deltoid acute scales, probably larger when alive, spreading, connate at the base. Bracts like the leaves, but rather smaller. Calyx and corolla not seen, as the specimen is in ripe fruit. Capsule 4–5 mm. in diameter, 4–5-celled.—*M. coriarium*, Burch. Trav. vol. i. p. 243 (1822), name only. DC. Prodr. vol. iii. p. 451: Sonder in Fl. Cap. vol. ii. p. 460: Berger, Mesemb. p. 292.

PHILIPSTOWN DIV. Near Petrusville, March 2, 1813, *Burchell*, 2679!

De Candolle has wrongly quoted Burchell's number 2487–3 for this species, but that number, as stated by Burchell himself, belongs to a species of *Ficus*. As there may also arise a misconception that *M. coriarium* was collected in the same region (Little Roggeveld) where he was on July 11, 1811, when he mentions in his 'Travels' that he found the Hottentots using the bark of an Acacia for tanning leather, and states that this *Mesembry-*

anthemum was also used for the same purpose, I here quote the full text concerning *M. coriarium*, which is as follows:—"The *Acacia-bark* possesses a large portion of the tanning principle, and imparts a reddish colour to the leather; but in other districts, several other sorts of barks are applied to the same purpose*." The asterisk refers to this footnote: "* Of which a kind of *Ficus*, C. G. 2487. 3. has been found to have powerful properties: and *Mesembryanthemum coriarium*, B. a new species allied to *M. uncinatum* has been seen used for this purpose by the Hottentots." These two plants were collected in the "other districts" alluded to—the *Ficus*, no. 2487–3, near the sources of the Kuruman River in Bechuanaland, and the *Mesembryanthemum* at the locality above stated; and doubtless it was Burchell's intention to give a description of the latter at the proper place in his 'Travels,' of which unfortunately only two volumes were ever published.

Burchell collected only a single specimen of *M. coriarium*, which is at Kew, and from it I have made the above description. Although in its very small leaves it may somewhat resemble *M. uncinatum*, yet the cymose arrangement of its flowers shows that it belongs to the section *Vaginata*, but is totally different from any other species in the group.

M. FLAVOCROCEUM, *Haw.* (§ Crocea). Stems taller, more woody and more bent than in *M. purpureocroceum*. Leaves somewhat crowded or distant, shorter than the internodes, terete-semicylindric, very obtuse, mealy-glaucous or glaucescent, more remote and firmer and less sensitive to cold, and flowers rather smaller than those of *M. purpureocroceum*. Calyx-lobes very much produced (elongated), fleshy or pulpy, especially when in fruit. Corolla yellow on both sides, saffron-coloured after fertilization or decay. Stamens and anthers short when mature, yellow. Styles (stigmas) about 7, very short, spreading, acute, ramentaceous (*i.e.*, densely and minutely plumosely branched) under a lens.—*M. flavocroceum*, Haw. in Phil. Mag. 1826, p. 129 (under the section *Crocea*). *M. purpureocroceum* var. *flavocroceum*, Haw. Rev. p. 155 (1821). *M. croceum* var. *flavocroceum*, DC. Prodr. vol. iii. p. 438 (1828).

SOUTH AFRICA. Locality unknown, *Burchell*.

The above is a translation combining all the characters assigned to this plant by Haworth, who under his description of it as a variety remarks that it is "probably a distinct species"—a view that after five years further knowledge of it he maintained. So that whether De Candolle (who probably never saw the plant) was justified in considering it to be a variety of *M. croceum* (which was well known to Haworth) is somewhat doubtful. Unfortunately, I cannot obtain any clue to the locality where it was collected, as the name is not mentioned in Burchell's MSS. I suspect, however, that it may be the plant entered as being *M. croceum* under number 1420–2, collected near Fraserburg, between Karree River and Klein Quaggas

Fontein, in Fraserburg Division, on Aug. 24, 1811. Of this no specimen, but only seeds (no. 53) were collected, and it is possible that from them this plant may have been raised.

No drawing of this plant exists at Kew, but there is a coloured drawing of typical *M. purpureocroceum*, Haw., which appears to me to be either a colour variety of *M. croceum* or a hybrid derived from it.

M. HISPIDUM var. PLATYPETALUM, *Haw.* (§ Hispicaulia). Taller (than the type), with more distant and more simple branches, more remote leaves, and fewer, broader, and darker purple petals. Probably a distinct species.—*M. hispidum* var. *platypetalum*, Haw. Rev. p. 186 (1821) : DC. Prodr. vol. iii. p. 442.

SOUTH AFRICA. Division ? *Burchell.*

The above is a translation of Haworth's description, and nothing more is known of this plant. No specimen of it exists at Kew, and the varietal name is not entered by Burchell in his MSS., but it is just possible that it may have been the plant entered in his catalogue under no. 2128–12 as being *M. hispidum.* Of this number, seeds only were collected and no specimen preserved. Burchell's descriptive note of the plant, made on the spot where it was found, is as follows:—"Stems erect, branching, hispid. Leaves vermiculate, terete, naked, obtuse, shining. Flowers small, of a beautiful purple ; petals spathulate, obtuse. Styles (really stigmas) 5, caudate. Capsule 5-celled." If this was the plant Haworth described, as is not improbable, it was found by Burchell during a journey made between the Vaal River and Graaf Reinet, March to May 1812. According to this it would not be likely to be the same species as *M. hispidum,* Linn., which was founded upon the plant figured in Dillenius, Hort. Elth. p. 289, figs. 277–278. The locality from which the Dillenian plant came is unknown, but it is scarcely likely to have been obtained from the interior region at that date (1732) ; also Burchell notes that the flowers of his plant are small, which is not the case with the Dillenian plant. There are, however, specimens collected by Burchell (no. 6406) on the eastern side of the Gouritz River, in Mossel Bay Division, on Nov. 5, 1814, that so well agree with the figures of Dillenius, that there can be no doubt they belong to typical *M. hispidum,* Linn., and the region where Burchell collected them is one from which the Dillenian plant might well have been obtained. Of no. 6406 Burchell collected 7 specimens, of which 5 are at Kew and the other two are probably in the Asa Gray Herbarium at Harvard University. The specimens are in full flower and no seeds of it were collected, so that, as these two nos. 2128–12 and 6406 are all that have the name *M. hispidum* assigned to them in Burchell's MSS., it tends to confirm the supposition that no. 2128–12 (seed 130) was the variety *platypetalum,* which has been omitted from the works of Sonder and Berger.

M. IMBRICATUM var. RUBRUM, *Haw.* (=*M. tumidulum*, Haw. § Tumidula). All mention of this plant is omitted from the works of Sonder and of Berger. At a later date Haworth placed it as a variety of *M. multiflorum*, Haw. But I find that it is quite identical with Salm-Dyck's figure of *M. tumidulum*, so that its synonymy is as follows :—

M. TUMIDULUM, Haw. Synop. p. 286 (1812) ; & Rev. p. 129 : Salm-Dyck, Mesemb. § 37, fig. 3, excluding the synonym *M. foliosum*, Haw., not of Sonder nor of Berger. *M. imbricatum* var. *rubrum*, Haw. Suppl. p. 95 (1819). *M. multiflorum* var. *rubrum*, Haw. Rev. p. 128 (1821) : DC. Prodr. vol. iii. p. 431.

SWELLENDAM DIV. By the right bank of the Zondereinde River, Jan. 27, 1815, *Burchell*, 7500 ! Seed 832.

Haworth described this as a variety of *M. imbricatum* from a plant raised in England from seed collected by Burchell in South Africa. In Burchell's MSS. seed-list (or 'Hortus Fulhamensis') the name *M. imbricatum* (without the varietal name, as was usually his custom) is entered under seed no. 832, which is stated to belong to no. 7500 of his Herbarium, and he remarks that the plant is showy, and its "flowers small, red in Africa, but white in England." As there is no evidence that the plant had flowered in England, since Burchell has no entry of its having done so, and Haworth remarks of it "I have only seen a living plant and dried flowers from Mr. Burchell," the remark that the flowers are white in England is doubtless intended to apply to the typical *M. imbricatum* and not to his own plant, which was then supposed to differ from *M. imbricatum* only by having red flowers. The habit of the plant and the number, size, details, and colour of the flowers are, however, all quite different from those of *M. imbricatum* and allies. No dried specimen of the cultivated plant appears to have been preserved, nor is there any drawing of it at Kew. But of no. 7500 Burchell collected five specimens—two of them are at Kew, and the others are probably in the Asa Gray Herbarium at Harvard University in the United States, and that at Petrograd.

The description of *M. tumidulum* by Sonder, more or less copied by Berger, is based upon a totally different plant with much larger flowers (see *M. festivum*, N. E. Br., p. 122) collected by Zeyher (no. 698) at Drietfontein in Van Rhynsdorp Division. Besides this plant of Zeyher's, Schlechter 8267, Wolley Dod, 1473, Pearson 3047, 3048, 3059, and Stephens & Glover 8734 have all been distributed under the name of *M. tumidulum* ; but they are all quite distinct from that species, and represent among them four perfectly distinct species, which all come from quite a different region, where *M. tumidulum* is not at all likely to grow.

At Kew there is an original coloured drawing of the type of *M. tumidulum*, but it represents merely a young branch without flowers. The leaves, however, well agree with those of Salm-Dyck's figure of *M. tumidulum* which I believe to be correctly named, and Burchell's specimens accurately agree with that figure.

M. foliosum, Haw., which Sonder, and Berger following him, have placed as a synonym of *M. tumidulum*, Haw., is quite a different plant, with much stouter leaves.

M. INCOMPTUM, *Haw.* (Section doubtful). A shrub half a foot (15 cm.) or more high, bushily very much branched; branches usually erect or with age decumbent. Leaves scarcely an inch (2½ cm.) long, crowded, erectly subimbricate, subulate, sausage-like semiterete, minutely papillose or subpapillose, pale green. Flowers terminal, usually ternately or biternately cymose or rarely solitary, at first neat, afterwards decaying, and at length untidy from the persistent finally decaying large bracts, clavate peduncles, and the swollen and as if finger-bearing calyces of the whole cyme. Peduncles terete, thickened above the ordinary leaf-like bracts, and the upper part almost fig-like after flowering. Calyx 5-lobed; lobes unequal, spreading, all at length more or less acutely finger-like, "præ alios persistentia tumida" (the meaning of which is obscure). Corolla small, as long as the calyx, expanding in the daytime; petals subequal, subentire, rather acute, white, shining. Stamens collected almost into a cone, the outer erectly recurved, without anthers, and by degrees becoming petal-like; filaments white; anthers white, becoming yellow; pollen yellow. Stigmas 5, erect, as long as the stamens, ramentaceous (*i.e.*, densely and minutely plumosely branched).—*M. incomptum*, Haw. Suppl. p. 96 (1819); & Rev. p. 171: DC. Prodr. vol. iii. p. 445: Lodd. Bot. Cab. t. 1311: G. Don, Gen. Syst. vol. iii. p. 147, not of Salm-Dyck, Sonder, or Berger.

PRIESKA DIV. Between Brak River and Vaal River, May 19, 1812, *Burchell*, 2128–13 (Seeds 131 & 175).

The above is a translation of the description given by Haworth in his 'Revisiones Plantarum Succulentarum,' and to it may be added the following particulars I have obtained from a drawing in the Kew Herbarium and the excellent figure in Loddiges's 'Botanical Cabinet,' which is not quoted by either Sonder or Berger:—Stem, in the drawing (which was probably made from a plant grown under glass) with internodes 16–22 mm. long, and in the published figure (which was probably made from a plant grown in the open air) with internodes 2–10 mm. long, bearing axillary tufts of leaves at the nodes. Leaves more or less crowded, ascending, straight or slightly incurved, 10–20 mm. long, 2 mm. thick, acute. Cyme, in the drawing, about 5-flowered, on a peduncle-like internode about 5 cm. long and gradually developing one flower at a time in its forkings, but in the published figure the cymes are not clearly shown; they are evidently on very short peduncles and 3-flowered. Bracts like the leaves but smaller. Pedicels 1–2 cm. long, much thickened in a clavately obconical manner at the apical part. Calyx abruptly dilated at the base of the lobes so as to form a distinct rim overhanging the ovary or clavate part of the pedicel ; lobes 5–10 mm. long, leaf-like,' acute, apparently separated from each other at the base by distinct but narrow intervals. Corolla 20–25 mm. diameter ; petals in 2 distinct series of apparently about 30 in each series, the outer 8–10 mm. long and 1 mm. broad, incurved-spreading, forming a somewhat saucer-like cup or perhaps later widely spreading, the inner about 5 mm. long and 1 mm. broad, erect, with recurved tips, forming a tubular cup surrounding and slightly overtopping the stamens, all linear, obtuse, pure white. Anthers yellow.

Burchell has the following note of this species in his MSS.:—"Stems many, erect and diffuse. Flowers small, unattractive, white. Stamens incumbent (perhaps collected together is meant). Nectaries 5, reddish, at the bottom of the calyx within the stamens. Styles (stigmas is meant) 5, subulate, hairy." He collected seeds only of it, from which living plants were raised in England, and no dried specimen of it was preserved by him. The thickened pedicels, the spaces between the calyx-lobes, and prominent overhanging rim or bulge at their base are very distinctive characters of this species.

The *M. incomptum* and var. *Ecklonis*, of Salm-Dyck, Sonder, and Berger, is a totally different plant, with weak stems 1–2 feet long and a flat (not cup-shaped) corolla, for which I propose the name *M. invalidum* (see p. 105).

M. MAGNIPUNCTATUM, *Haw.* (§ Magnipuncta). This species is in cultivation and correctly understood, although sometimes mistaken for *M. nobile*, Haw., from which it differs by its leaves being broader and more obtuse and flat (not concave) on the upper side.—*M. magnipunctatum*, Haw. Suppl. p. 87 (1819) : Burch. Trav. vol. i. p. 272 : Sonder in Fl. Cap. vol. ii. p. 396 : Berger, Mesemb. p. 264. *M. magnipunctum*, Haw. Rev. p. 86 (1821) : DC. Prodr. vol. iii. p. 419.

FRASERBURG DIV. Between Karree River and Klein Quaggas Fontein, near Fraserburg, Aug. 24, 1811, *Burchell*, 1402–3 (Seed 85).

No dried specimen of this species was preserved by Burchell, who collected only seeds of it, from which he raised living plants in England, and from these the species was described by Haworth. It varies considerably in the size of its leaves, which vary from 15 to 25 mm. in breadth. A fine coloured drawing of the typical plant collected by Bowie is preserved at Kew. Burchell notes in his MSS. that the leaves are "glaucescent, obscurely dotted. Calyx equal. Styles (stigmas) 12."

M. MEDIUM, *Haw.* (a synonym of *M. latum*, Haw.). (§ Linguiformia.) Nearly stemless. Leaves very broadly tongue-shaped or cultrate, without a hook at the tip, sloping downwards, 3–4 in. (7½–10 cm.) long, 1 in. (2½ cm.) broad, deep green. Peduncle 1 in. (2½ cm.) long. With the general appearance of *M. scalpratum*, but much smaller, yet much larger than the rest of its allies. It flowers in the autumn.

The above is a translation of Haworth's descriptions combined. The following is a description made from a coloured drawing of the type plant preserved at Kew :—Leaves apparently about 6–8 to a growth, spreading right and left in two rows close to the ground, turned edgeways to the sky, 5–7½ cm. long, 2–2½ cm. broad, straight, strap-shaped or tongue-shaped, very obtusely rounded at the apex and not hooked or curved there, flat above, convex on the back, deep green. Peduncles erect, 10–15 mm. long, 5 mm. thick, acutely angular as is evidently the calyx, green. Calyx-lobes about 15–18 mm. long and 10 mm. broad, broadly oblong or ovate-oblong, with the apex apparently broadly rounded and abruptly contracted into a short point. Corolla large, represented as only partly open, but probably 7–8 cm. in diameter when expanded; petals apparently 40–45, about 4 cm. long and 1½ mm. broad, linear, obtuse, bright yellow, perhaps tinted with red on the back. Burchell in his MSS. *Ephemeris*, p. 111, describes the flower as follows :—"Calyx acutely triquetrous, with unequal sides; lobes 4, with membranous margins, 3 of them keeled. Stamens numerous. Stigmas 12, depressed-spreading, papillose, purplish. Ovary 12-celled."—*M. medium*, Haw. Suppl. p. 88 (1819); & Rev. p. 95: DC. Prodr. vol. iii. p. 421.

MOSSEL BAY DIV. On the eastern side of Little Brak River, Oct. 10, 1814, *Burchell*, 6197–7 (the type). Somerset Div. at Commadagga, July 5, 1813, *Burchell*, 3309.

Seeds only were collected of both the numbers quoted, and no specimen of the cultivated plant was preserved by Burchell, but there is a good coloured drawing of it at Kew, from which I have made the description given above.

This species is placed as a synonym of *M. cultratrum* var. *perviride* by Salm-Dyck, and Sonder and Berger have followed him in this view, but it is quite distinct from *M. cultratum* and undoubtedly identical with *M. latum*, Haw. (see p. 69), which may well have been obtained from the Mossel Bay region, where, as I have pointed out (p. 129), the true *M. hispidum*, Linn. may also have been procured. Although Burchell has also entered the name *M. medium* under no. 3309, the type, as noted above, is no. 6197–7, and I doubt if the Commadagga plant is really identical with it.

M. MULTIFLORUM var. RUBRUM, *Haw.* This is *M. tumidulum*, Haw. See under *M. imbricatum* var. *rubrum*, Haw.

M. PUSTULATUM, *Haw.* (§ Linguiformia). This species appears to be correctly understood, and is well figured by Salm-Dyck.—*M. pustulatum*, Haw. Suppl. p. 88 (1819); & Rev. p. 96: DC. Prodr. vol. iii. p. 422:

Salm-Dyck, Mesemb. § 8, fig. 10: Sond. in Fl. Cap. vol. ii. p. 404. *M. linguiforme* var. *pustulatum*, Berger, Mesemb. p. 240.

Port Elizabeth Div. Near Port Elizabeth, Dec. 1813, *Burchell*, 4378–2.

No dried specimen of this plant was preserved by Burchell, who collected only seeds of it, from which the living plants described by Haworth were raised. No drawing of the original plant appears to have been made.

M. salmoneum, *Haw.* (§ Spinulifera). Roots of old plants swollen at the upper part. Stems or branches of old plants 2–3 ft. (60–90 cm.) long; branches somewhat filiform, weak, elongated, pendulous or prostrate. Leaves of plants grown in the open air longer than the internodes, linear, attenuate at each end, almost always channelled, pale or bright green, dully (sordide) papillose. Flowers trichotomous, of moderate size or smallish at first, especially outside, fulvous or salmon-coloured, yellow at the base, afterwards paler or rosy, and finally rosy outside and more or less whitish within. Peduncle clavate and together with the calyx glitteringly papulose. Calyx 5-lobed. Stamens erect, of various lengths; filaments white; anthers or pollen yellow. Stigmas 5, erect, smooth, yellowish-white. Ovary elevated a little above the calyx, slightly convex, 5-celled.—*M. salmoneum*, Haw. Rev. p. 176 (1821): DC. Prodr. vol. iii. p. 444: Salm-Dyck, Mesemb. § 56, fig. 2: Sonder in Fl. Cap. vol. ii. p. 451: Berger, Mesemb. p. 71.

South Africa. Without locality, *Burchell*.

The above is a translation of Haworth's original description, from which this species would appear to be one of those in which the colour of the flowers changes from day to day. No specimen of it was preserved by Burchell, nor has he made any entry of the name in his MSS. lists, so that the locality where he collected it cannot be traced, and there is no drawing of the plant at Kew. The figure and description of Salm-Dyck, Sonder, and Berger do not quite accord with Haworth's description, but may be intended for the right plant.

M. sessiliflorum var. album, *Haw.* (§ Platyphylla). Root subbiennial. Lower leaves ovate, petiolate; the upper lanceolate and subalternate, glitteringly papillose, especially beneath. Flowers paniculate, sessile, small, white. —*M. sessiliflorum* var. *album*, Haw. Rev. p. 158 (1821): DC. Prodr. vol. iii. p. 448. *M. sessiliflorum* var. *β*, Haw. Suppl. p. 93 (1819).

Graaff Reinet Div. Along the Sundays River, near Monkey Ford, March 30, 1813, *Burchell*, Seed 428, according to a list of species named by Haworth at the end of Burchell's list of seeds (*Hortus Fulhamensis*, MSS.).

The above is a translation of Haworth's description, to which he adds the remark that he doubts if it is a variety of *M. sessiliflorum*, Ait., as it differs from that species in the following particulars:—"The flowers are white, not yellow. The branches suberect-decumbent, *paniculate*, with the branchlets scarcely spreading and in a manner rather decumbent-ascending." Burchell collected seeds only of this species, from which the plants described by Haworth were raised in England.

Sonder, and Berger copying from him, places this plant as a synonym of *M. clandestinum*, Haw., which it is scarcely likely to be, as that plant is stated to have been introduced in 1874 by Masson, who so far as known did not go to the Graaff Reinet Region. In 1873 he collected in the coastal districts only, and in 1774 went to the Roggeveld with Thunberg. *M. clandestinum* differs according to the descriptions of it in being a perennial with pedicellate (not sessile) flowers, 1–3 together or in cymes, not paniculate. Also Haworth had both plants in cultivation, and would therefore know them to be different.

M. SULCATUM, *Haw.* (§ Digitiflora). (Pl. **10**. fig. 45.) An erect shrub up to 90 cm. (3 ft.) high, leafy. Branches about 3 mm. thick, dividing at the top into a large lax cyme composed of 3 smaller leafy flat-topped cymes, each about 6 cm. in diameter, with 4–6 (or perhaps more) flowers, which appear to develop one at a time; internodes 1½–4 cm. long, green. Leaves 2–3½ cm. long, 3–3^1 mm. broad and about as thick, spreading, clustered at the nodes, linear-subulate, semiterete, channelled down the upper side, at least when young, rounded on the back, acute or subobtuse, apparently glabrous, pale green. Peduncle 10–15 mm. long. Calyx 5-lobed; lobes unequal, 10–15 mm. long, resembling the leaves, but smaller, acute, green. Corolla about 25 mm. in diameter; petals very numerous, about 12 mm. long and ½ mm. broad, very narrowly linear or almost setaceous, very spreading, with recurved tips, according to Haworth white or silky-white within and at first somewhat straw-coloured outside, shining, but according to the drawing the basal part is of a very pale yellowish and the tips tinted with reddish-buff. Stamens mostly collected into a dense erect column about 5 mm. long, with a few of the outer without anthers, and spreading away from it, and gradually becoming petal-like. Stigmas 5, erect, not overtopping the stamens.—*M. sulcatum*, Haw. Rev. p. 173 (1821): DC. Prodr. vol. iii. p. 445: G. Don, Gen. Syst. vol. iii. p. 147, not of other authors.

SOUTH AFRICA. Locality unknown, *Burchell.*

The above description is made partly from Haworth's original description, all the characters given by him being embodied in it, and partly from an original drawing of a portion of the type plant preserved at Kew, labelled "*M. sulcatum*, Haw. Received from Mr. Haworth in 1823, who obtained it from Mr. Burchell." This drawing represents a portion of a branch with a large 3-branched cyme, of which only one branch is coloured, the remainder being outlined in pencil; the coloured branch I have copied upon Pl. **10.**

fig. 45. The whole drawing is evidently only a portion of a large plant. Haworth compares it with *M. fastigiatum* and states that it is perhaps a variety of *M. splendens*, but at the same time mentions several characters whereby it differs from that plant. Although this statement has been repeated by subsequent authors, a glance at the figures of the two species is sufficient to show that they are totally distinct. Haworth describes the leaves as crowded, but the drawing does not represent them to be so, although it is evidently a rather leafy species. According to Haworth it flowers in September.

I have failed to obtain from Burchell's MSS. any clue to the locality where he collected the seeds of this species from which the living plants that Haworth described were raised, for there is no dried specimen of it among those that he collected, and I do not find the name entered in either his catalogue or seed-list (*Hortus Fulhamensis*) at Kew.

M. TESTACEUM, *Haw.* (§ Trichotoma). Old stems shrubby, erect, 2–3 ft. (60–90 cm.) high, branched. Leaves semiterete, subtriquetrous, glaucescent, somewhat papulose-shining. Flowers terminal, umbellate-trichotomous, small, pedunculate. Calyx short, with subequal lobes. Petals in one series, testaceous-saffron-coloured. Stamens and imperfect filaments collected into a cone, white, shining.

The above is a combined translation of Haworth's two descriptions of this plant. The following are made from two coloured drawings of it at Kew. One drawing, labelled "*Mesembr. testaceum*, Haw. Received from Mr. Haworth in 1823, who obtained it from Mr. Burchell," represents an erect straight flowerless branch 2 mm. thick, with internodes 8–13 mm. long, whose leaves spread horizontally or are recurved or reflexed from their base, 2–4 cm. long and 2 mm. thick, trigonous, acute, with tufts of smaller leaves in their axils, giving it a very leafy appearance. This drawing was probably made from a plant grown under glass. The other is labelled "*Mesm. testaceum*, Aug. 4th, 1826," and was probably made from the same plant at a later date grown in the open air. It represents a short branch 1½ mm. thick, with 2 branchlets 1 mm. thick having internodes 5–10 mm. long, bearing one terminal flower. The leaves are 10–18 mm. long, 1½–2½ mm. thick, horizontally spreading, slightly curved, trigonous, acute, with tufts of smaller leaves in their axils. Pedicel apparently about 5 mm. long, but hidden. Calyx not shown. Corolla 16 mm. in diameter; petals apparently about 50 in about 2 series, 6 mm. long, 1 mm. broad, linear, obtuse, of a peculiar red colour. Stamens collected into a cone 3 mm. long, 3 mm. in diameter at the base, and 1½ mm. in diameter at the top; filaments white; anthers yellow.—*M. testaceum*, Haw. Suppl. p. 97; & Rev. p. 178: DC. Prodr. vol. iii. p. 443.

South Africa. Collected during a journey made between the Vaal River and Graaff Reinet in March to May 1812, *Burchell*, 2128–3.

Haworth's description was made from living plants raised in England from seeds collected by Burchell, who did not preserve any specimen of it, so that the two drawings at Kew and the description represent all that is known of it. Burchell has noted in his MSS. that the root is "fusiform, multiplex," which may mean that it either has a fleshy or woody much-divided root or a cluster of roots something like those of a Dahlia on a small scale. Haworth states that it is similar to *M. fastigiatum*, Haw., but has thicker and less erect branches and leaves nearly three times as large.

The *M. testaceum* of Sonder in Fl. Cap. vol. ii. p. 441, and of Berger, Mesemb. p. 101, is based upon a plant collected by Zeyher on hills near the Zwartkops River, in Port Elizabeth Division, which is so far out of the region where Burchell found the plant that there is no probability of its being the same species.

M. turbiniforme, *Haw.* (§ Fissurata). Plant stemless, obconic, exactly truncate at the top, obscurely dotted, two or three more times larger than *M. truncatellum* etc.—*M. turbiniforme*, Haw. Rev. p. 84 (1821): Burchell, Trav. vol. i. p. 310: DC. Prodr. vol. iii. p. 417: Don, Gen. Syst. vol. iii. p. 126: Berger, Mesemb. p. 291.

Prieska Div. At Zand Vlei, between Keikams Poort and the Orange River, growing among siliceous and white calcareous stones, Sept. 14, 1811, *Burchell*, 1630–2.

As I am preparing a monograph of the group to which this species belongs and will there give a full account and figure of it, I merely include it here to make complete the enumeration of the species described from Burchell's collection. For, as I write, the news comes to hand that this species, which has remained quite unknown to botanist and gardener alike for over one hundred years since Burchell found it, has now been re-found in the same locality where Burchell discovered it. Burchell did not introduce it into cultivation, and, according to his catalogue, only collected two dried specimens of it, but as their number has been crossed out by Burchell himself and there were no specimens of it in his Herbarium when it came to Kew, they were probably lost or destroyed by insects. Haworth's description (translated above) was prepared from a drawing that Burchell made in South Africa. He made a large number of such drawings, but they appear to have disappeared, as I have quite failed to discover what became of them.

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The following is an explanation of the abbreviations used for the books quoted:—

Ait. Hort. Kew.	Aiton, W. Hortus Kewensis, ed. 1, vol. ii. (1789).
Ait. f. Hort. Kew.	Aiton, W. T. —— Ed. 2, vol. iii. (1811).
Ann. S. Afr. Mus.	Annals of the South African Museum (1913).
Berger, Mesemb.	Berger. Mesembrianthemen und Portulacaceen (1908).
Bot. Reg.	Lindley, J. Botanical Register.
Bradley, Hist. Succ.	Bradley, R. History of Succulent Plants (1716–1727).
Burch. Trav.	Burchell, W. J. Travels in the interior of Southern Africa, vol. i. (1822), vol. ii. (1824).
Burm. Rar. Afr. Pl.	Burman, J. Rariorum Africanorum Plantarum (1738).
DC. Pl. Grass.	Candolle, A. P. de. Histoire des Plantes Grasses (1799–1829).
DC. Prodr.	—— Prodromus Systematis Naturalis Regni Vegetabilis, vol. iii. (1828).
Dillen. Hort. Elth.	Dillenius, J. J. Hortus Elthamensis (1732).
Don, Gen. Syst.	Don, G., jr. General System of Gardening and Botany, vol. iii. (1834).
Fl. Cap.	Harvey, W. H., & O. W. Sonder. Flora Capensis, vol. ii. (1862).
Haw. Obs.	Haworth, A. H. Observations on the genus *Mesembryanthemum* (1794).
Haw. Misc.	—— Miscellanea Naturalia (1803).
Haw. Rev.	—— Revisiones Plantarum Succulentarum (1821).
Haw. Suppl.	—— Supplementum Plantarum Succulentarum (1819).
Haw. Synop.	—— Synopsis Plantarum Succulentarum (1812).
Hill, Hort. Kew.	Hill, J. Hortus Kewensis, ed. 1 (1768).
Jacq. Fragm.	Jacquin, N. J. Fragmenta Botanica (1800–1809).
Lam. Encycl.	Lamarck, J. B. M., *Chev.* de. Encyclopédie Méthodique, vol. ii. (1786).
Linn. Sp. Pl.	Linnæus, C. Species Plantarum, ed. 1 (1753).
Lodd. Bot. Cab.	Loddiges, C., & Sons. Botanical Cabinet (1818–24).
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Nov. Act. Nat. Cur. Ephem.	Nova Acta Cæsarea Leopoldina-Carolina Naturæ Curiosorum, Ephemerides, vol. viii. (1791).
Phil. Mag.	Philosophical Magazine and Journal (1823–1826).
Salm-Dyck, Hort. Dyck.	Salm-Reifferscheid-Dyck, J. Hortus Dyckensis (1834).
Salm-Dyck, Mesemb.	—— Monographia generum Aloes et Mesembryanthemi (1836–1863).
Salm-Dyck, Obs. Bot.	—— Observationes Botanicæ in Horto Dyckensi (1820).
Spreng. Syst. Veg.	Sprengel, C. Systema Vegetabilum, vol. ii. (1825).
Thunb. Fl. Cap.	Thunberg, P. Flora Capensis, ed. Schultes (1823).
Trans. Roy. Soc. S. Afr.	Transactions of the Royal Society of South Africa, vols. i. & ii. (1908–1912).
Weston, English Fl.	Weston, R. English Flora (1775).
Weston. Univ. Bot.	—— Universal Botanist, vol. i. (1770).
Willd. Sp. Pl.	Willdenow, C. L. Species Plantarum, vol. ii. (1799)

EXPLANATION OF THE PLATES.

(Unless otherwise stated, all the drawings are of natural size and made from living plants.)

Plate 5.

Figs. 1 & 2. *M. mitratum*, Marl. Copied from Dr. Marloth's figures.

Figs. 3 & 4. *M. proximum*, N. E. Br. 3, a cluster of three cones as seen in June; 4, outline of one of those cones, showing the size it had attained in October of the same year.

Figs. 5–8. *M. clivorum*, N. E. Br. 5 & 6, two branches from the same plant as seen in April; 7, the terminal body (corresponding to the cone of fig. 1) of the larger branch of fig. 6 in its resting stage at the end of August of the same year; 8, apex of leaf enlarged, showing papillate surface.

Fig. 9. *M. dissitum*, N. E. Br.

Fig. 10. *M. moniliforme*, Haw. Drawn partly from a very crude sketch and partly from memory, therefore only approximately correct.

Plate 6.

Fig. 11. *M. dissitum*, N. E. Br. This figure represents the terminal cone of fig. 9 making its new growth: A, A, being the new pair of leaves formed and concealed within the cone, the dark patches on them being the dried-up fragments of the exhausted cone; B, a new internode of stem developing; C, early stage of a new cone, at this time scarcely distinguishable from the internode.

Figs. 12–13. *M. tuberculatum*, Mill. 12 represents two growths in April, and 13 the outline of the larger growth when fully developed in October.

Fig. 14. *M. bibracteatum*, Haw. Copied from a drawing of a type plant.

Figs. 15–18. *M. vescum*, N. E. Br. 15–16, two growths as seen in July; 17, outline of a growth in October, with sections below the tips of the leaves; 18, enlarged outline of the tip of the larger leaf of a pair.

Figs. 19–20. *M. inspersum*, N. E. Br. With sections of the leaves.

Plate 7.

Figs. 21–22. *M. cognatum*, N. E. Br. 22 is an enlarged tip of a leaf.

Fig. 23. *M. cylindricum*, Haw. Copied from a drawing of a type plant.

Fig. 24. *M. diminutum*, Haw. Copied from a drawing of a type plant.

Figs. 25–26. *M. candidissimum*, N. E. Br. A small plant and tip of a leaf from a dried specimen of a larger plant.

Fig. 27. *M. rostratoides*, Haw. Copied from a drawing of a type plant.

Plate 8.

Fig. 28. *M. purpurascens*, Salm-Dyck. Copied from a drawing of a type plant.

Figs. 29–31. *M. rostratum*, Linn. Two growths representing the plant as seen in June and one growth as seen in November of the same year; 31, enlarged apex of leaf.

Plate 9.

Fig. 32. *M. quadrifidum*, Haw. Copied from a drawing of a type plant. This supposed species is really the true *M. rostratum*, Linn.

Fig. 33. *M. denticulatum*, Haw. Copied from a drawing of a type plant.

Figs. 34–35. *M. bifidum*, Haw. 34 is copied from a drawing made in March 1825 from a type plant; 35, outline of a full-grown growth with section of a leaf, made from a living plant in Oct. 1918.

Fig. 36. *M. lectum*, N. E. Br.

Fig. 37. *M. robustum*, Haw. Copied from a drawing of a type plant.

Figs. 38–39. *M. subalbum*, N. E. Br.

Plate 10.

Fig. 40. *M. fissoides*, Haw. Copied from a drawing of a type plant.

Figs. 41–42. *M. binum*, N. E. Br.

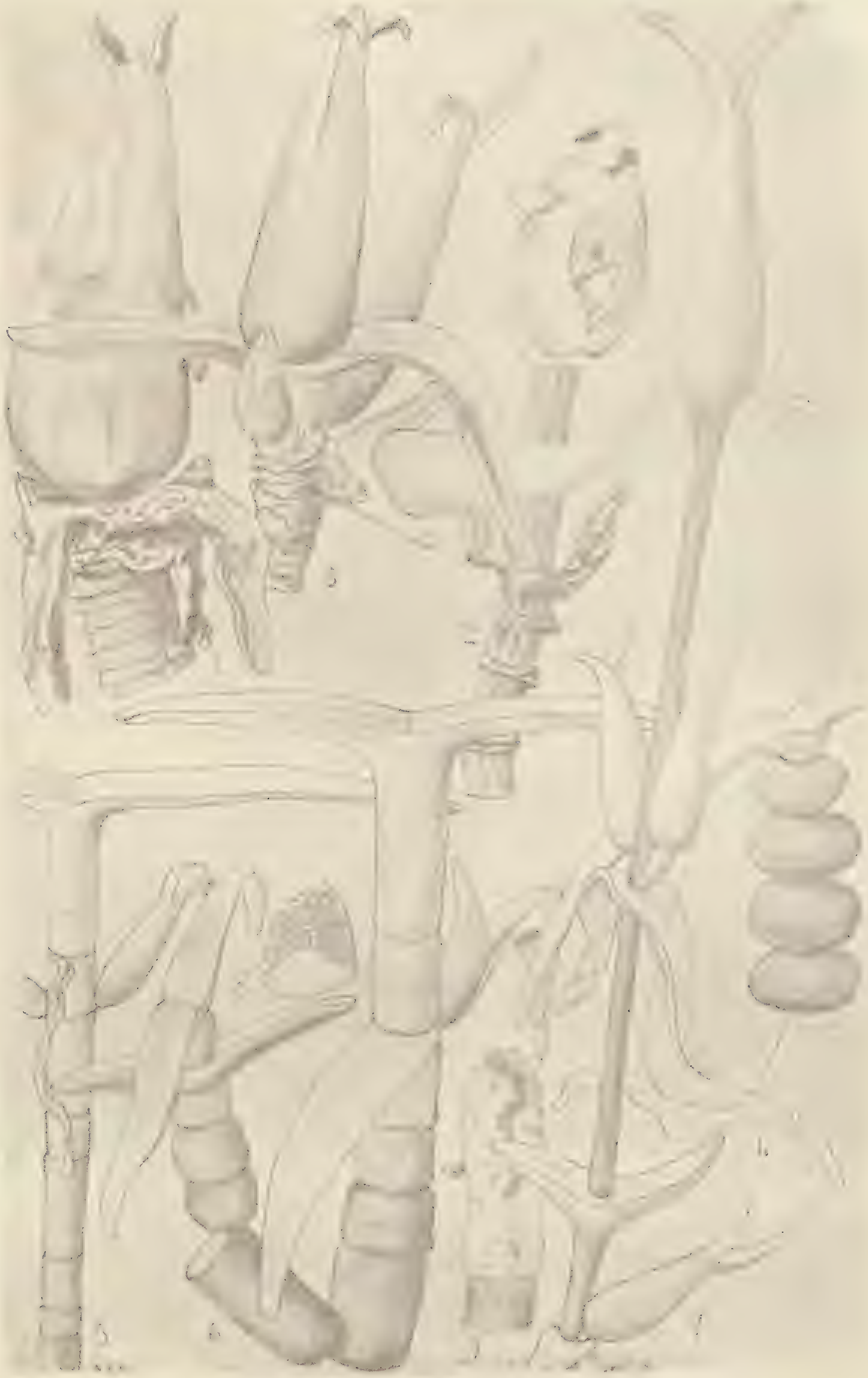
Fig. 43. *M. herbeum*, N. E. Br.

Fig. 44. *M. læve*, Ait. Copied from a drawing of a type plant; only half of the branch represented on the drawing is here reproduced.

Fig. 45. *M. sulcatum*, Haw. Copied from a drawing of a type plant.

Fig. 46. *M. pressum*, N. E. Br., with sections of both forms of leaf taken at half an inch below the apex.

JOURN. LINN. SOC., BOT. VOL. XLV. PL. 5.



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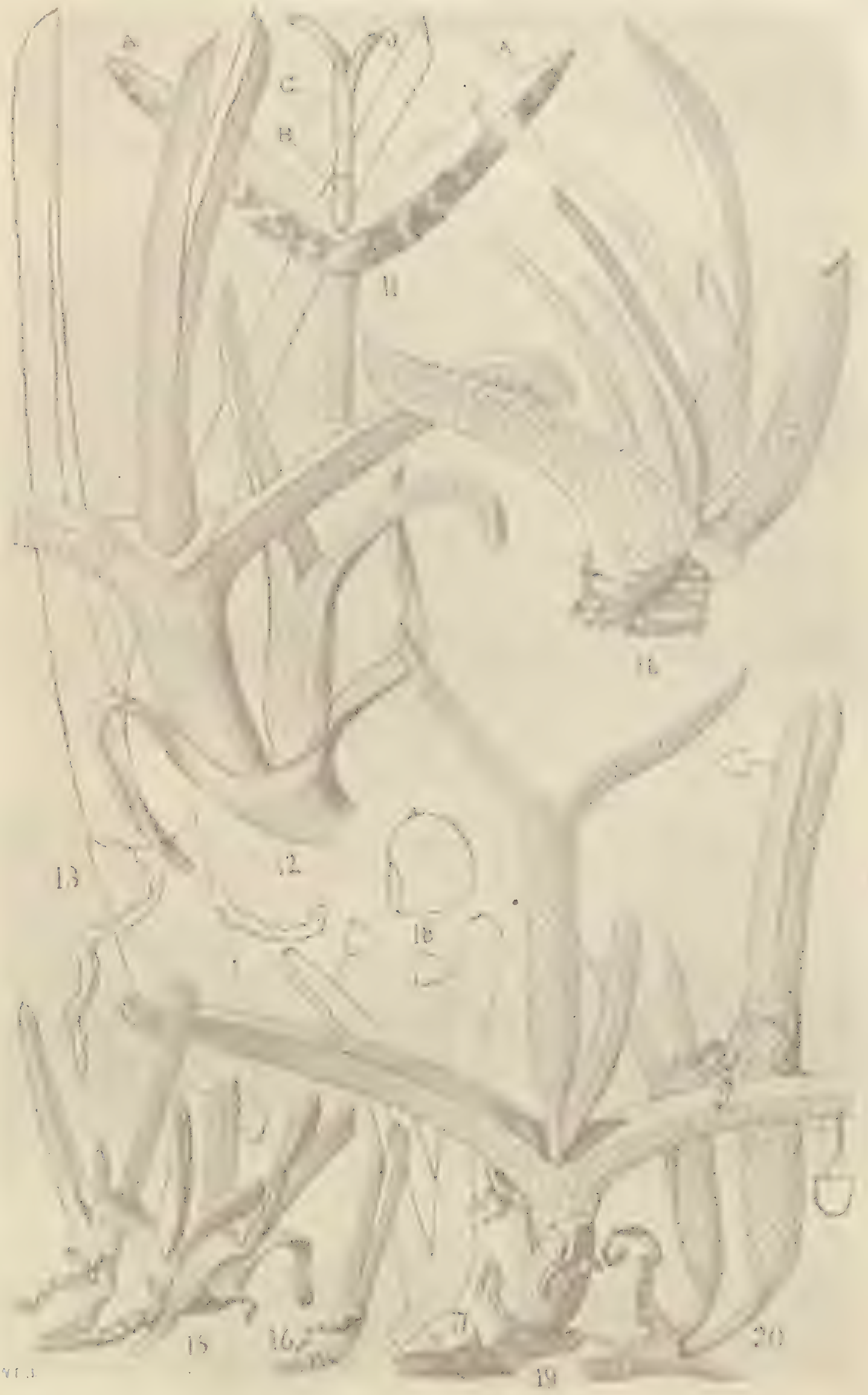
Grout Sc. and imp

SPECIES OF MESEMBRYANTHEMUM.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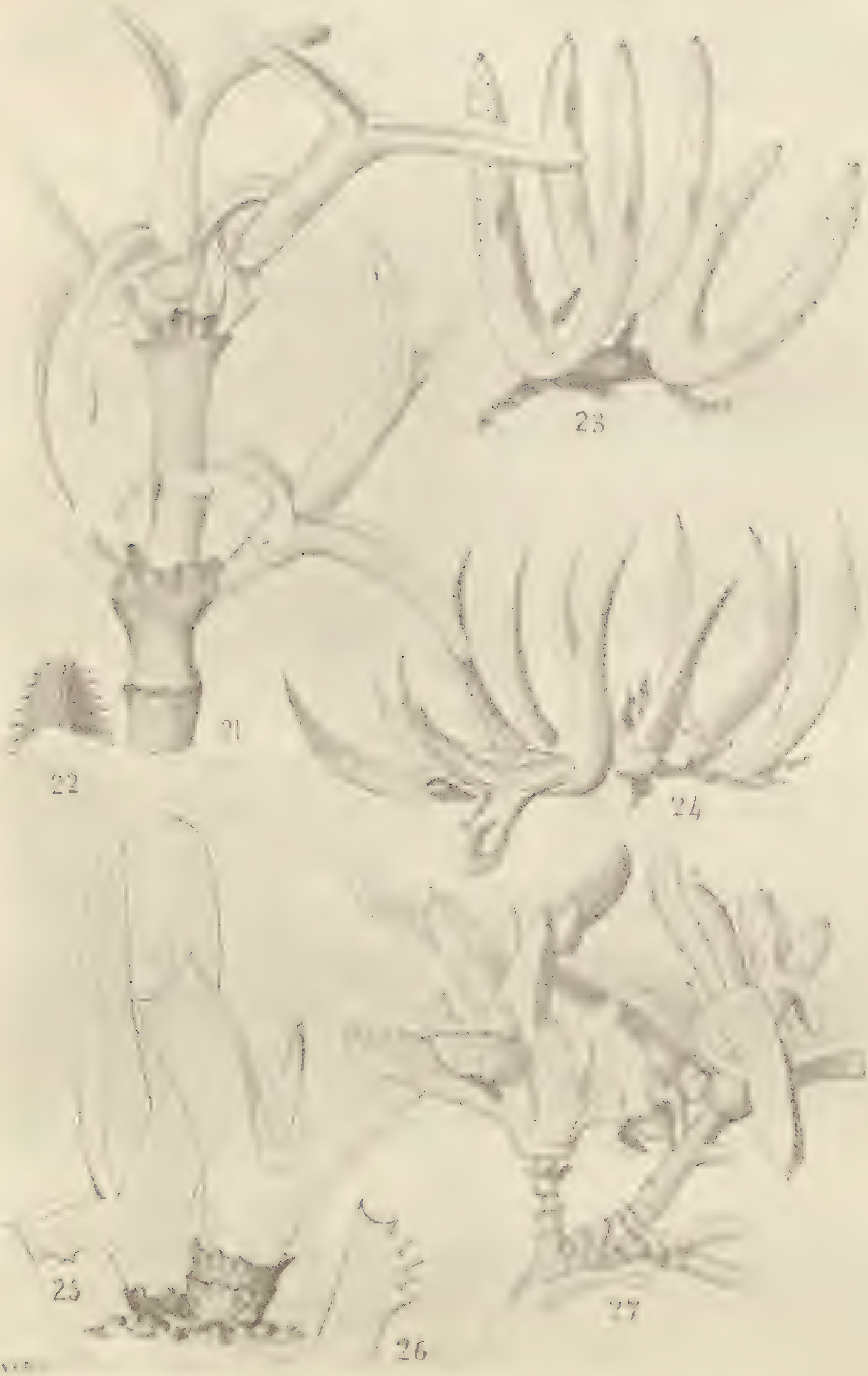
Grout Sc. and imp.

SPECIES OF MESEMBRYANTHEMUM.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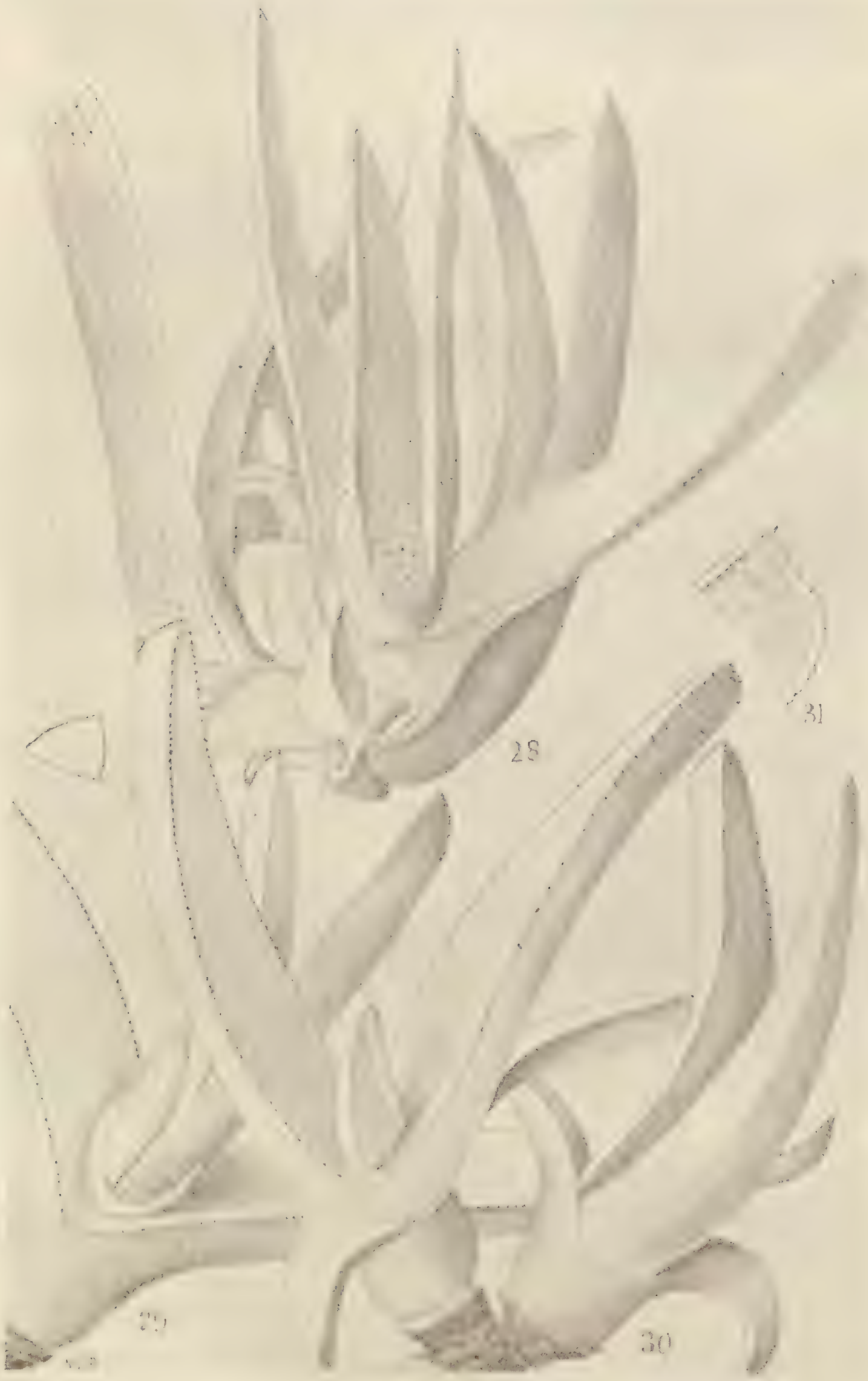
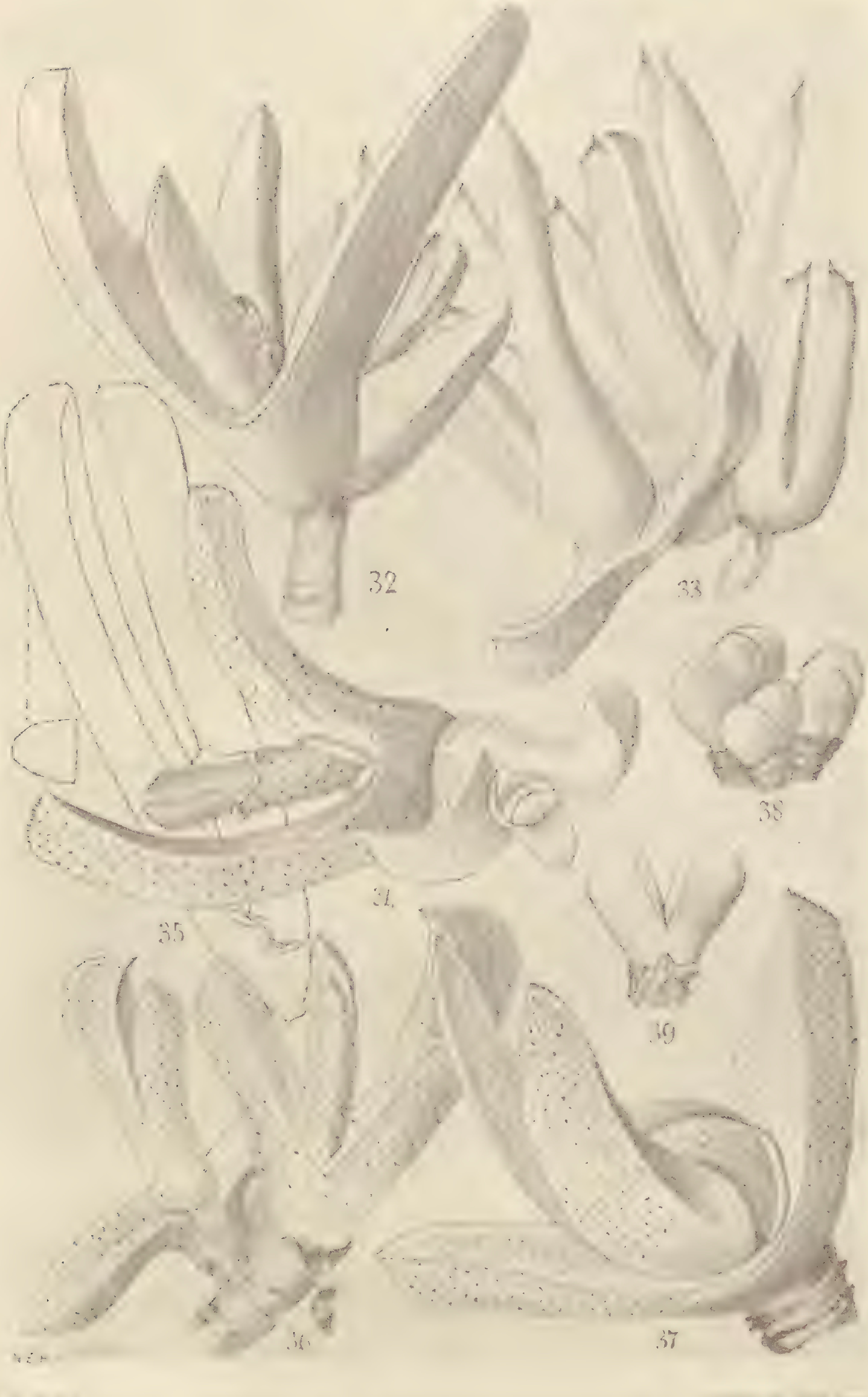
SPECIES OF MESEMBRYANTHEMUM



N. E. B. del.

Grout sc. and imp.

SPECIES OF MESEMBRYANTHEMUM.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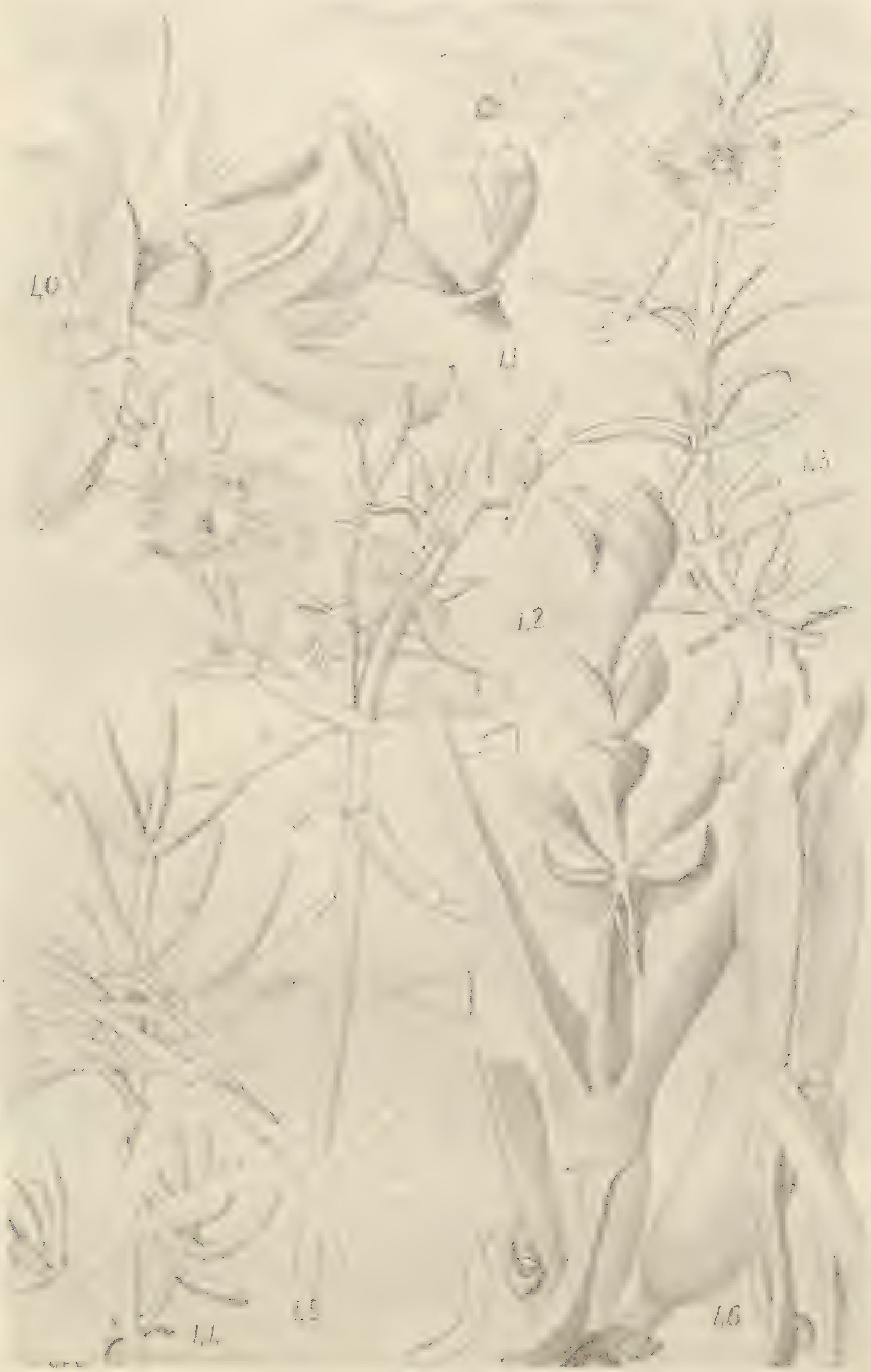
N.E.B.

N. E. B. del. Cooper Sc. and Imp.

SPECIES OF MESEMBRYANTHEMUM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[illegible] sc. and imp.

SPECIES OF MESEMBRYANTHEMUM

A New Species of *Lobostemon* in the Linnean Herbarium.

By N. E. Brown, A.L.S.

[Read 6th February, 1919.]

In the summer of 1917 my attention was directed by Mr. C. C. Lacaita to a specimen in the Linnean Herbarium from South Africa named *Echium argenteum*, which proved to be a species of *Lobostemon* that could not be identified with any species in the Kew Herbarium or at the British Museum; for it is entirely different from *Echium argenteum*, Bergius (now *Lobostemon argenteum*, Buek), with which Linné had supposed it to be identical. From enquiries made I am informed that there is no specimen like it in the South African or Bolus Herbaria, so that the following description of this new species is entirely based upon the unique specimen in the Linnean Herbarium which was collected at least 147 years ago, and does not appear to have been found by any collector since that date. Its chief characteristics are the ascending narrow silvery leaves with recurved tips, compact head-like cymes, and especially the large sepals.

LOBOSTEMON MAGNISEPALUM, N. E. Br.

Frutex vel fruticulus 30 cm. vel ultra altus, ramosus, ramis vel caulibus nudis ramulis foliosis. Folia subconferta, adscendentia, 10–17 mm. longa, 2–3 mm. lata, lineari-lanceolata, apice subacuta, recurva, adpresse argenteo-pubescentia. Cymæ subcapituliformes, circa 2 cm. longæ et 2½ cm. latæ, 5–6-floræ. Bracteæ 15 mm. longæ, anguste lanceolatæ, acutæ. Sepala 9–10 mm. longa, 1¼–1½ mm. lata, lineari-attentuata, acuta, molliter sub-adpresse pubescentia. Corolla sepalis circa 8 mm. longiora, 10–12 mm. diametro, extra puberula.

A small shrub or shrublet; the specimen is about 30 cm. high, with about 8 branches at the upper part, naked below, leafy on the branches, which are softly and somewhat adpressedly villose. Leaves ascending, numerous, rather closely placed, 10–17 mm. long, 2–3 mm. broad, linear-lanceolate, subacute, with recurved tips, silvery-pubescent, with intermingled soft adpressed and slightly spreading fine hairs, no hard hairs. Cymes head-like, about 2 cm. long and 2½ cm. broad, apparently about 5–6-flowered, with several narrowly lanceolate acute bracts about 1½ cm. long. Sepals 9–10 mm. long, 1¼–1½ mm. broad, linear-attenuate, acute, softly pubescent, with somewhat adpressed moderately long hairs. Corolla of the dried specimen about 8 mm. longer than the calyx and 10–12 mm. in diameter, puberulous outside.—*Echium argenteum*, Linn. Mantissa, ii. p. 202 (1771), not of Bergius ; *E. fruticosum*, Linn. MS. No. 145, conf. Proc. Linn. Soc. 1917–18, Suppl. p. 10.

South Africa. "Montibus nigris" according to Linné, which probably means either the Zwartberg Range in Oudtshoorn Division, or the Great Zwartberg in Malmesbury Division, the latter being perhaps the more probable locality. Collected by C. R. Tulbagh.

Notes on a Visit to Kunadiyaparawita Mountain, Ceylon.

By FREDERICK LEWIS, F.L.S.

(With Text-figure.)

[Read 20th March, 1919.]

THE object of this paper is to draw attention to the influence upon plant distribution of very special environment. The case selected for consideration is one of the most remarkable of the Ceylonese mountains, and one that may be regarded as unique, both from its abnormal climatic conditions and from its physical surroundings. The resulting feature that appears to be most striking is the high proportion of Ceylon endemics persisting or surviving at the summit of the mountain itself, a situation which ordinarily is not specially inimical to the successful growth of forms found wild, both in Ceylon and in neighbouring countries.

The material obtained from the summit of the hill under consideration may not be complete, but it is as full as could be made in a day's systematic collection within an area of very limited extent, and for that reason may be taken as comprehensive.

This curious mountain is situated in the Ratnapura district, in the Province of Sabaragamuwa, and stands nearly due west of "Adam's Peak." It is not connected with the great chain of mountains that forms the division between the Central and Sabaragamuwa Provinces, of which the Sacred Peak of Adam forms the most conspicuous point, being divided therefrom by a deep and wide valley. It rises with great abruptness from a moderately broad but much grooved base to an altitude of 5186 feet above the sea, and is completely surrounded by high forest. On its eastern flank it presents a bold precipice of rock, that narrows to a shoulder of terrific steepness on the south, while on the north and west the mountain may be described as walled by precipices of varying height. The summit is small in extent, but is slightly hollowed, giving rise to a small stream, which rapidly descends over numberless falls into the country to the south. Roughly speaking, this summit may be regarded as an elevated island, of 5000 feet altitude, in a sea of forest. Moreover, the mountain stands in the direct path of the S.W. monsoon, which rages over its crest with enormous force during the period (from about April to September) when the S.W. winds are at their maximum. On the west there are no mountains high enough, or near enough, to break the force of the wind, with the natural result that the vegetation is stunted to a remarkable degree. The N.E. monsoon, on the other hand, having expended its violence before reaching this mountain, leaves it in possession of a period of calm of a most serene character, so much so, that one can hear the rumble of the streams some thousands of feet below, or the crowing of a cock in the scattered village below the great eastern flanking precipice.

The effect of these extremes of wind-movement is to produce a marked contrast of rainfall; that on the eastern base being approximately 230 inches per annum, while on the western limit another 100 inches* may be taken to fall.

During a short visit I paid to the valley on the west, in the evenings, between noon and 6 P.M., over 4, 5, and 6 inches of rain fell each afternoon, leaving the soil saturated with water, and the air completely vapour-laden from sunrise to 10 A.M., after which the rains fell afresh.

With such conditions as these it is easily realized that the flora of the locality is certain to be curiously affected, not only in structural development, but in particular as regards fructification. As might be expected, the plants themselves, that form the vegetation on the summit of this remarkable mountain, are typically of the character comprehended as "wet-zone flora."

Their method of reaching the summit must probably have been along the narrow wedge of forest that connects the base with the top; but while that assumption may be admitted, it is difficult to realize that the ultimate result corresponds to forms occurring at corresponding altitudes entirely separated by stupendous chasms of unbridged space. Nor is the altitudinal distribution free from exception, for while *Rhododendron arboreum* is abundant from 4500 feet and upwards on "Adam's Peak," there is not a single example of it to be seen on Kunadiyaparawita. Conversely, within a very narrow belt between 4000 and 4500 feet altitude, *Kendrickia Walkeri* occurs on Kunadiyaparawita, while it is to be found in a broad belt between 3000 and 4500 feet in the Ilabekanda Forests, 20 miles away.

In neither of these examples can any particular development of the seed be found to suggest a special means for dispersion.

Again, the practical absence of animal life, birds, or monkeys at the summit of this peak renders it unsafe to assume that seeds could have been conveyed by their agency, nor can it be assumed, on examining the individual structure of the fruits and seeds of the plants collected at the summit, that the majority owe their presence to wind transport.

One would expect to find that composites would occur in abundance on the top of the mountain, but instead, I found only three (Nos. 22, 30, and 34).

The catalogue of plants at the end of this paper affords brief details regarding each species, including an analysis of their distribution. This catalogue clearly indicates that the great majority of the Kunadiyan flora is endemic, while the base of the mountain is fully supplied with forms not entirely confined to Ceylon.

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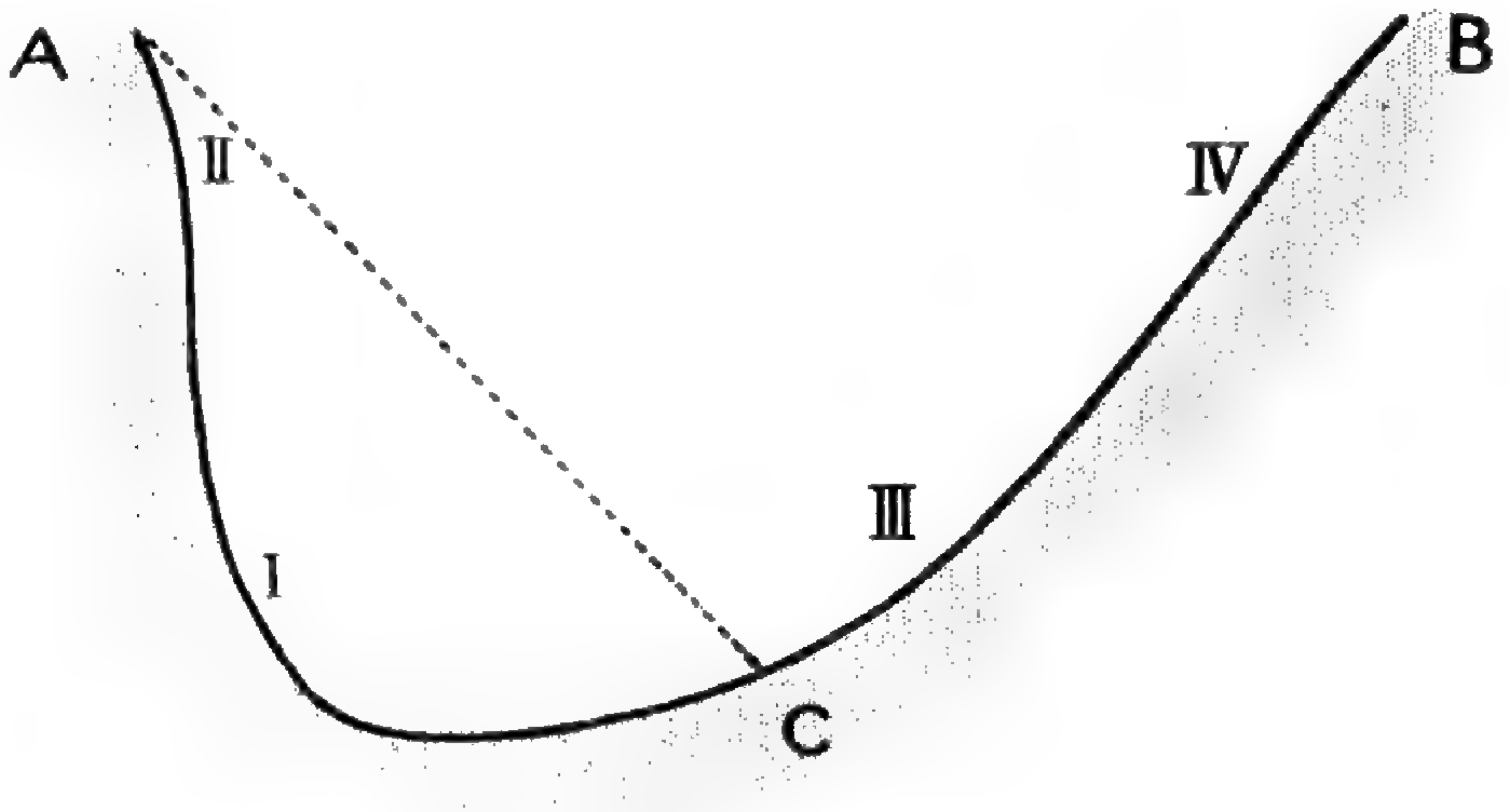
* Some years ago a resident in the valley on the western side of this mountain informed me that in two successive years the recorded rainfall exceeded 400 inches each year.

It is striking that while many of the examples, in the case of Kunadiyaparawita, appear to be confined to a vertically narrow zone, or belt, of distribution, the same species in another part of the island appears to be more widely spread.

Two theories present themselves for consideration in the matter, that may be best illustrated by the following diagram :—



A, C, B, represents the section across a valley as it is at present, but the dotted line A, C was possibly the outline at a very remote period till erosion cut back the intervening formation to its present outline. The distance from I to II, and from III to IV, is vertically the same, but, *superficially,* III *to* IV is larger as regards the area on which plants could obtain a foothold. Equally, owing to the angle from III to IV being lower, the direct action of gravitation on such fruits as are unequipped with special developmentsf or dispersal must be more favourable to lodgment than if these fruits, or seeds, fell on ground of a high angle of inclination.

If this hypothesis be correct, it seems to me that not only is the area I, II less, but gravitation would tend to reduce still further the areas occupied by species on steep land, as opposed to land more gently sloping, for the steeper the land the more rocky in general will it be, and so the less chance of foothold will it afford. It would follow, therefore, that the proportion of successful fruits would become less and less as the land became steeper and steeper.

If this theory is examined further, it appears to be reasonable to accept the converse to account for a wider distribution of those species, unprovided with special structural modification, in those localities where the natural slope of the land is so gradual as to eliminate the influence of gravity on the individual fruit or seed. In such cases it might follow that the steeper the land, the more rapid the effects of erosion; while in flatter land there would be a greater congestion of individuals, and consequently an effort to spread away from such congested areas, either upwards or downwards.

Taking a concrete case as an example, *Stemonoporus affinis* occurs very sparingly between 4000 and 5000 feet altitude on Kunadiyaparawita. This is an endemic form, and bears nearly spherical fruit, dehiscing previous to germination, along slightly depressed sutures, but affording no hooks, prickles, or spines to arrest a rolling movement on steep ground. On the flanks of a mountain several miles to the east of Kunadiyaparawita this same species is to be found in very great abundance, from about 3500 feet altitude to over 5000 feet, but in this case the slope of the land is comparatively moderate.

I have already shown that the rainfall around the mountain under consideration is very considerable, and its influence in erosion cannot be overlooked, so that comparatively rapid cutting away of the soil appears to be a reasonable factor, as compared with localities with a lower ground inclination and a lesser volume of rain.

It may not be out of place to mention that in the valley of the Kuruganga, to the north and west of the mountain here treated of, was once a small "planting district," known as Kuruwitti. One of many pilgrim paths to Adam's Peak follows this valley, and probably optimistic land speculators, attracted by the luxuriant growth of the forest, were led to believe that equally luxuriant commercial products would result on planting up the locality with coffee, cinchona, and tea. In 1879 an estate was opened by a Scottish gentleman, following an experiment in commercial agriculture, attempted in 1862 by a Moorman of more enterprise than judgment, that early failed to respond to his efforts. Arabian coffee, cinchona, and tea were all tried in turn. The last survived precariously, but these ventures were all financial failures, with the result that abandonment followed. It is therefore of interest to note, that while cultural operations in Ceylon have invariably been the means of introducing many new "weeds," the summit of Kunadiyaparawita does not to-day indicate the presence of such "escapes" from the properties that were opened and abandoned close by. The same may be said of escapes from native gardens, none of which have reached the mountain top, though identical "escapes" are found at an altitude equal to this peak in distant places.

It is also worthy of notice that, while the rapidity with which newly-introduced forms adapt themselves and take possession is a characteristic of

Ceylon, here, at an altitude not inimical to the success of introduced "weeds," the absence of such plants appears to be a special feature. At the same altitude as the summit of Kunadiyaparawita such forms as *Ageratum conyzoides*, *Amarantus gangeticus*, and *Solanum trilobatum* are constantly met with, but here are totally absent. Again, as will be seen by reference to the notes on the plants obtained at the apex of the mountain referred to, the proportion of endemics is far greater than that of other species common to Ceylon and its neighbouring countries. The isolation of the point, and its remarkable surroundings, added to climatic conditions, superlative as regards Ceylon as a whole, may possibly combine to influence the vegetative result in the direction of predominance of endemics as compared with forms common to other countries. This certainly appears to be the case here.

The general inaccessibility of the mountain top has preserved it from introductions directly traceable to human origin, hence the struggle has been more between endemics and endemics than between them and invaders from elsewhere. I think it may be inferred from the facts that I have attempted to set forth, that a high percentage of endemics may always be associated with exceedingly steep mountains, and that the seeming narrowness of vertical distribution in these instances is attributable to physical conditions of preponderating power.

In conclusion, I must frankly admit that the time at my disposal did not admit of my making an exhaustive examination, foot by foot, of the mountain from base to summit—a treat for future explorers,—but I venture to assume that the material collected from the actual summit of the mountain is sufficient to bear out the hypotheses I have ventured to advance.

I have to thank Mr. T. Petch, B.A., B.Sc., of the Royal Botanic Gardens at Peradeniya, for his great kindness and consideration in supplying me with the identification of the material I brought away. This obligation is all the greater, as I am fully conscious of the ceaseless strain this gentleman has upon his time in the discharge of his official work, so that his generous assistance leaves me all the more indebted to him.

Lastly, my obligations are due for the valuable aid and liberal help I received from Mrs. Dulling, who cordially undertook the irksome and uninteresting work of preparing these pages from my original MSS.

List of the Plants.

DILLENIACEÆ.

(1) *Acrotrema uniflorum* var. *petiolare*, Thw. Endemic.

Very common on the summit with the next.

(11, 53) —— var. *rotundatum*, Thw. Endemic.

On rocks under shade.

GUTTIFERÆ.

(25) *Calophyllum Thwaitesii*, Planch. Endemic.

Forming a bush-like tree growing at the very summit, but no others of this species to be seen lower down.

TERNSTRŒMIACEÆ.

(24) *Ternstrœmia emarginata*, Choisy. Endemic.

A shrubby plant. "Upper mountain zone, especially by streams; rather rare." Trimen.

DIPTEROCARPACEÆ.

(10) *Stemonoporus Gardneri*, Thw. Endemic.

A short tree with pale stem, growing in abundance at the summit. The twigs are many, short, stiff, terminating with cluster of leaves. I have found this species in abundance on other exposed mountains in the same province, as at Wallankanda and Pettiagallakanda. Trimen gives it as rare, and records it from Ramboda, where Gardner collected it, and from near Adam's Peak.

TILIACEÆ.

(45) *Elæocarpus zeylanicus*, Mast. Endemic.

I only observed a single plant of this at the summit. "Very rare. Adam's Peak, at about 5000 ft." Trimen.

(29, 50) *E. glandulifer*, Mast. Endemic.

Forming a bush from 2 to 6 feet high. Plentiful at the summit.

GERANIACEÆ.

(3) *Impatiens elongata*, Arn. Endemic.

Growing in small gregarious masses on wet rock, just below the summit. Trimen says: "Very rare; only known from Adam's Peak, where first collected by Mrs. Walker. I found it half-way up on the Maskeliya side, at about 4500 feet, in abundance." I myself carefully examined the stream lower down for more examples of this remarkably beautiful balsam, but entirely without success.

RUTACEÆ.

(35, 39) *Evodia Roxburghiana*, Benth.

Forming a small stunted tree with curiously diminutive leaves. From the very summit I measured one tree that was only a little over 2 ft. high. Common below 2000 feet in wet zone. Also Indian hills, Malaya, Sumatra, and Java.

HALORAGEÆ.

(61) *Serpicula zeylanica*, Arn. Endemic.

Found on wet rocks in the stream flowing from the very summit. "Upper mountain zone; very rare. On Adam's Peak, where it is abundant near the base of the uppermost cone." Trimen.

MYRTACEÆ.

(1) *Eugenia cordifolia*, Wight. Endemic.

Summit; plentiful in the wet zone.

(33, 40) *E. cyclophylla*, Thw. Endemic.

Occasional, at the summit, where it forms a low bush. "Very rare; only found on ascent to Adam's Peak." Trimen.

MELASTOMACEÆ.

(55) *Sonerila rostrata*, C. B. Clarke. Endemic.

Moderately plentiful in shady, damp places. Trimen records Ambegamuwa, Hiniduma, and Reigam Korale for this, but none of these places are anywhere near to Kunadiyaparawita. He regards it as a variety.

(21, 28) *S. hirsutula*, Arn. Endemic.

Growing in small clusters in damp crevices of rock. Flowers white, but usually "deep rosy pink . . . Rare; from Pedrotalegalla, foot of Totapella, Horton Plains." Trimen.

RUBIACEÆ.

(5, 20) *Hedyotis Lessertiana* var. *flavescens*, Thw. Endemic.

Forming small trees from 3 to 5 feet high, growing in abundance on the shoulder immediately below the summit. Trimen records this variety from Maskeliya, Adam's Peak, and Galagama, all places of high altitude. I have frequently obtained it in the Horton Plains.

(59) *H. Gardneri*, Thw. Endemic.

A most remarkable plant, with the appearance of a *Dracæna*, and easily distinguished by its abundant and profuse chartaceous stipules. It is plentiful just below the very summit, and appears to die off after it attains a height of 8 feet.

I first met with this curious plant in the mountainous country north-west of Kunadiyaparawita, and again near the base of the cone of Adam's Peak, but nowhere else. Thwaites gives Adam's Peak for habitat.

(13 *a*) *H. Lawsoniæ*, Wight & Arn. Endemic.

Abundant at the summit, growing gregariously. "Upper mountain zone; common." Trimen.

(51) *Lasianthus varians*, Thw. Endemic.

Growing in masses and forming stout bushes. "Upper mountain zone; common." Trimen.

COMPOSITÆ.

(22, 36) *Vernonia Wightiana*, Arn. Endemic.

Very plentiful at the highest point of the apex of the mountain. "Common from 4000 feet upwards." Trimen.

(30) *Anaphalis cinnamomea*, C. B. Clarke.

One isolated cluster found at the summit. "Upper mountain zone; common." Trimen. Also in Himalayas, Upper Burma, N. China, and Japan.

(34) *Emilia zeylanica* var. *Walkeri*, Trimen. Endemic.

From the very summit; here it has a creeping habit, growing among low bushes. Flowers bright, soft pink. "About N. Eliya . . . Adam's Peak." Trimen.

CAMPANULACEÆ.

(15, 16) *Lobelia trichandra*, Wight. Possibly S. Indian.

Very plentiful at the summit. Common at high altitudes. Recorded by Trimen as a variety ("scarcely worth separation") of *L. nicotianæfolia*, Heyne.

SAPOTACEÆ.

(27) *Isonandra lanceolata* var. *compta*, Thw. Endemic.

Forms a bushy shrub, and occurs plentifully at the summit. "Adam's Peak." Trimen.

(32) *Palaquium rubiginosum*, Engl. Endemic.

Very abundant, and in full flower at the time of my visit. Plentiful from 4000 feet upwards, and making quite a large tree. Branchlets and twigs stout, with leaves crowded at ends. "Moist region up to 4000 feet. Rare." Trimen.

(46) *Palaquium* sp.

A single example, obtained from the summit.

STYRACEÆ.

(18) *Symplocos hispidula*, Thw. Endemic.

Forming a small tree, occurring from 4000 feet and onwards. "Rare." Trimen.

(9) *S. cordifolia*, Thw. Endemic.

A short bush growing on the summit. Recorded by Trimen as growing at 6000–7000 feet; rare.

GENTIANACEÆ.

(54) *Exacum Walkeri*, Arn. Endemic.

Common at the summit. Flowers white. "Upper mountain zone, 5000–6000 feet; rare." Trimen.

(2) *Exacum* sp. Endemic (?).

Plentiful at the summit.

Regarding this Mr. Petch writes:—"The *Exacum* is very interesting. Certainly it is not *Walkeri*. *Walkeri* has a peculiar staminal structure, not noted in the books, which at once differentiates it from other species. Your specimens also show a peculiarity in the stamens; they are curved at the apex, so that the opening at the top of the anther becomes lateral. They are near var. *pallens* of *E. zeylanicum*, but that is a blue one. I do not think it will make a species, but it is a good variety of *zeylanicum*."

LENTIBULARIACEÆ.

(6) *Utricularia orbiculata*, Wall.

Plentiful on wet rocks immediately below the summit. A beautiful mountain species which I have repeatedly found in damp places, and on stems of trees. Occurs "in the mountains of India, Malaya, and S. China." Trimen.

GESNERACEÆ.

(60) *Didymocarpus zeylanicus*, R. Br. Endemic.

This example was obtained from some very steep, rocky ground, about 1000 feet below the summit; here it grows gregariously. Leaves curiously variable in size on the same plant. "Mountain zone, very rare; near Adam's Peak." Trimen.

LABIATÆ.

(7) *Pogostemon rupestris*, Benth. Endemic.

In damp places under other growth. A very common mountain species.

LAURACEÆ.

(49) *Actinodaphne molochina* var. *Moonii*, Hook. f. Endemic.

Moderately plentiful at the summit. "Central prov. at an elevation of 5000 to 7000 ft." Thwaites.

(37) *A. speciosa*, Nees. Endemic.

Occasional, not very common on the summit, and with leaves much stunted and crumpled. Abundant in forests of 6000 feet altitude.

PIPERACEÆ.

(14) *Peperomia reflexa*, A. Dietr.

Growing on tree stems at the very summit. Recorded from India, Malaya, China, Australia, Africa, America.

EUPHORBIACEÆ.

(23) *Daphniphyllum glaucescens*, Blume.

A plentiful bush where the soil is a little deep. "Forests of mountain zone, 4000–7000 feet; common." Trimen. Also in South India, Java, and China.

(26) *Agrostistachys longifolia*, Benth.

The most common plant on the top of this mountain, but very much stunted. Stems often crowded with moss. Common from 3000 feet upwards. Also in S. India and Malaya.

ORCHIDACEÆ.

(52) *Dendrobium heterocarpum*, Wall.

The "Primrose Orchid." Not very scarce at the summit. "Upper mountain zone above 6000 ft." Trimen. Also Himalayas, Khasia, and Nilgiri Mts., Burma, Java, Philippines.

(57) *Cœlogyne breviscapa*, Lindl. Endemic.

Growing at about 500 feet below the summit. "Upper mountain zone; rather rare." Trimen.

(12, 13, 17, 41) *Saccolabium brevifolium*, Lindl. Endemic.

Common on the very summit. "Common; forests throughout mountain zone." Trimen.

(4) *Podochilus falcatus*, Lindl. Endemic.

From the summit. Fairly common in the hill-country between 3000 and 6000 feet altitude.

PANDANACEÆ.

(47) *Freycinetia Walkeri*, Solms.

Obtained from the rocks on the very summit. "Climbing over large trees in moist region up to 4000 feet. Common." Trimen. Also in Andamans. I have found this in abundance in the lower valleys at the foot of Kunadiyaparawita.

ERIOCAULONACEÆ.

(48) *Eriocaulon caulescens*, Hook. f. & Thoms. Endemic.

Growing in a small swamp in the valley immediately below the summit. "5000–8000 ft., very rare. Adam's Peak, plentiful." Trimen.

GRAMINEÆ.

(31) *Arundinaria Walkeriana*, Munro.

A short pestiferous bamboo, growing in small clumps at the very summit. An annoyingly spine-tipped leaf makes the presence of this plant readily felt. Common on the Horton Plains, at 7000 feet altitude. Also in S. India.

(42) *A. debilis*, Thw. Endemic.

Scrambling thinly over bushes at the summit. Common at highest altitudes.

FILICES.

(19) *Lindsaya orbiculata* var. *schizophylla*, Baker. Endemic.

From the summit; the only other ferns I found here being the common *Gleichenia linearis*, C. B. Clarke, and the next.

(56) *L. decomposita,* Willd.

Found alone, on damp ground at the summit.

Variation in the Flower of *Jasminum malabaricum*, Wight.

By HAROLD H. MANN, D.Sc., F.L.S.

[Read 3rd April, 1919.]

IN the forests of the Western Ghats in the latitude of Belgaum in the Bombay Presidency much of the jungle is covered, during the month of April, with flowers of the climber *Jasminum malabaricum*, which make one of the most attractive and most fragrant elements in the daily view. The flowers open during March, and only a few odd stragglers are left after the end of April. The flower of this, as of all the jasmines, is very variable, and a recent stay which I made in these jungles when the plant happened to be in flower led me to examine the calyx and corolla of a large number of flowers (undoubtedly absolutely wild), in order to try and ascertain the extent of their variability, and how far there was any correlation between the number of lobes of the corolla and of the calyx.

Between April 13th and 20th, 1916, the lobes of the corolla from 2789 flowers and the lobes or teeth of the calyx from 3560 flowers were counted, with the following results :—

Corolla lobes.

Flowers with	5 lobes	9 =	0·33 per cent.
	6 do.	208 =	7·48 per cent.
	7 do.	897 =	32·16 per cent.
	8 do.	1125 =	40·33 per cent.
	9 do.	465 =	16·67 per cent.
	10 do.	76 =	2·72 per cent
	11 do.	8 =	0·28 per cent.
	12 do.	1 =	0·04 per cent.
	Total	2789	

Calyx lobes or teeth.

Flowers with	4 teeth	91 =	2·56 per cent.
	5 do.	1647 =	46·26 per cent.
	6 do.	1702 =	47·81 per cent.
	7 do.	112 =	3·15 per cent.
	8 do.	8 =	0·22 per cent.
	Total	3560	

The most frequent number of corolla lobes is eight, but a smaller number is more likely than a higher number. The frequency of flowers with five or with six calyx teeth is almost equal. Those with four or with seven teeth are rare, while those with eight are very rare indeed. One calyx tooth was found with the colouring and fragrance of the corolla, and this was of a bifid character.

My records show no relationship between the position on the branch and the number of teeth in the calyx *. It was impossible to get similar figures for the corolla, as this falls off very early. The record for the whole of the calyx teeth on two separate branches, inflorescence by inflorescence, starting from the lowest part of the branch, is given below. Where two inflorescences occur at the same level in the branch they have been placed together :—

Branch No. 1. (Plant vigorous, growing well.)
Total number of flowers examined—840.

Number of calyx teeth.	Inflorescence Number.										Percentage of total.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
4	1	—	—	—	—	1	—	—	—	—	0·2
5	9	16	5	—	39	34	29	27	4	38	24·8
6	16	27	6	19	101	75	132	73	7	130	69·0
7	2	1	1	—	12	11	10	1	3	7	5·7
8	—	—	—	—	1	—	1	—	—	1	0·4
Total ..	28	44	12	19	153	121	172	101	14	176	

Branch No. 2. (Plant poorer than last, and not very flourishing.)
Total number of flowers examined—270.

Number of calyx teeth.	Inflorescence Number.						Percentage of total.
	(1)	(2)	(3)	(4)	(5)	(6)	
4	–	3	1	1	–	—	1·9
5	6	25	5	12	24	4	28·1
6	19	63	20	20	31	12	61·1
7	1	10	2	2	5	3	8·5
8	—	1	—	—	—	—	0·4
Total ..	26	102	28	35	60	19	

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* In this connection Burkill's work (Journal Linn. Soc. (Bot.) vol. xxxi. p. 216) on variations in the number of stamens and carpels is interesting. He does not, however, deal with variation in the corolla or calyx of flowers. See also Haacke, Biol. Centralbl. 1896.

The various inflorescences appear to vary quite irregularly, except that the less vigorously growing inflorescences show a lower percentage of specimens with six calyx lobes and a higher percentage with five.

The season of flowering is too short to make it possible to obtain satisfactory data as to whether the early flowers differ from the later flowers in the inflorescence in respect of the number of corolla lobes or of calyx teeth. So far as my figures are concerned, there seems to be no clear connection.

The difference in different plants is, however, very marked, and also the difference in plants from different villages. Thus we have for a number of plants whose flowers were collected on April 13th the following figures:—

Plant No.	Number of flowers examined.	Corolla Lobes.						Calyx Teeth.				
		Number with						Number with				
		6 lobes.	7 lobes.	8 lobes.	9 lobes.	10 lobes.	11 lobes.	4 teeth.	5 teeth.	6 teeth.	7 teeth.	8 teeth.
I.	70	—	1	35	27	6	1	1	22	47	—	...
II.	293 corollas, 140 calyces.	7	103	157	25	1	—	—	101	38	1	—
III.	120 corollas. 48 calyces.	9	56	48	7	—	—	—	17	30	1	—
IV.	70	—	—	—	—	—	—	2	48	20	—	..
V.	840	—	—	—	—	—	—	2	208	579	48	3
VI.	270	—	—	—	—	—	—	5	76	165	23	1
VII.	191	—		—	—	—	—	6	74	107	4	

The variation here is very considerable and remarkable. In the number of corolla lobes, while the normal seems probably to be eight, yet in the various plants there seem to be very strong tendencies respectively towards the formation of flowers with more than this number or with less than this number. Each plant does not vary nearly so widely on its separate branches, and so it is evident that the existence of a large proportion of flowers with more corolla lobes than eight or with less than this number is a function chiefly of the individuality of the plant.

Somewhat similar conclusions are reached with regard to the calyx teeth. Here there are plants in which five teeth seem the normal number in the calyx ; others in which six teeth seem normal. But either condition seems to be a function of the individuality of the plant.

Taking the whole of the flowers examined, the following figures show the mean and the variability * :—

	Corolla Lobes.	*Calyx Teeth.*
Mean number of lobes (or teeth)	7·75 (from 2789 flowers)	5·52 (from 3580 flowers)
Standard deviation..	0·9456	0·6140
Probable error of standard deviation	± 0·0085	± 0·00155
Coefficient of variability	12·2	3·52

Correlation of the number of Corolla Lobes and Calyx Teeth in the same flower.—The figures obtained bring out a very interesting case of the correlation of the two characters studied. In 1669 cases the calyx teeth and corolla lobes were counted on the same flowers, and the results are shown in the following table. This indicates the number of flowers with any particular number of calyx teeth (4, 5, &c.) in association with the various numbers of corolla lobes. Thus among the 576 flowers which had seven corolla lobes, there were 16 with four calyx teeth, 316 with five, 231 with six, 12 with seven, and 1 with eight :—

Number of calyx teeth.	Number of Corolla Lobes.							Total.
	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
4	1	5	16	13	7	1	—	43
5	2	108	316	336	99	14	1	876
6	—	42	231	306	116	23	3	721
7	1	—	12	8	5	—	—	26
8	—	—	1	2	—	—	—	3
Total ..	4	155	576	665	227	38	4	1669
Mean ..	5·25	5·24	5·42	5·47	5·52	5·58	5·75	5·44

The correlation between the number of the corolla lobes and number of calyx teeth thus appears to be very slight. The coefficient of correlation works out as + ·1148: that is to say, there is a slight, but only a slight, tendency for the number of corolla lobes to increase as the number of calyx teeth increases and *vice versâ.*

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* By Chauvenet's rule, from these data the probability is that the number of the corolla lobes may vary normally from 4·2 to 11·3. Thus 12 is outside the limit indicated, and might perhaps be classed as abnormal. In the case of the calyx teeth by the same rule, the probability is that the number may vary normally from 3·2 to 7·9. Thus none of the figures recorded should be classed as abnormal. I have retained the whole of the figures both for corolla lobes and calyx teeth in all my calculations.

A Contribution to the Flora of Australia.

By SPENCER LE M. MOORE, B.Sc., F.L.S.

(PLATES **11**, **12**.)

[Read 19th June, 1919.]

I. On two Species of *Tribulus* described by Robert Brown.
II. Some New or Rare West Australian Plants from the recent Collections of Dr. F. Stoward and Mr. J. E. C. Maryon.
III. Some New or Rare Australian Species of older Collections.

DURING the past few years I have devoted considerable time to work upon the Australian collections at the British Museum, and in the following pages have put on record some of the results yielded by investigation of the older collections and also of two others more recently received. For this work the chief guide has been Bentham's invaluable though now somewhat antiquated 'Flora Australiensis,' fortified by Mueller's 'Second Systematic Census of Australian Plants' and the extensive and evergrowing literature published subsequently. No attempt, it must be understood, is made to reveal fully the Museum treasures; though had this not been the case, considerable diversities in the range of species as compared with those given by Bentham, as also in the names of collectors, could have been set on record. Especially would this have applied to some of the recent German monographs dealing with the plants of Australia: namely, those written without a visit to this country—a deviation from the old custom very much to be deprecated—and in consequence often quite ludicrously inadequate in the matter of citation.

The work has been rendered more difficult owing to the comparative rarity of Bentham's visits to the Museum, so that his handwriting is not often in evidence upon the sheets. This is the more remarkable inasmuch as Brown's plants, besides those of Banks and Solander, were easily available for examination. This failure to devote the requisite time to Brown's collections was unfortunate, as some of the material even now remains unnamed, of which neglect the reader will find an instance in the pages of this memoir devoted to the genus *Phyllanthus*. Another matter for regret is that Brown left unpublished so many of his MS. descriptions, as thereby several hundred types were lost to the establishment of which he was the ornament and ever will be the glory.

I. ON TWO SPECIES OF *TRIBULUS* DESCRIBED BY ROBERT BROWN.

(Plate **11**. A.)

Tribulus Hystrix, R. Br. (Pl. **11**. A. fig. 1) is a plant which has been mistaken by Bentham and other writers on the Australian flora. Brown's description * is as follows :—"lanatus, foliis 8–10-jugis, fructibus undique tectis spinis subulatis longitudine inæqualibus: majoribus sparsis longitudinem cocci superantibus.

Loc. 'In collinis arenosis. Lat. 26°.' D. Sturt.

Descr. Herba diffusa, sericea, incana. Folium majus cujusque paris 8–10-jugum, foliolis ovatis. Flores magni. Calyx æstivatione leviter imbricata. Petala calyce duplo longiora. Stamina decem, antheris linearibus."

Under *T. Hystrix*, Bentham † remarks: "The specimens"—he cites as collectors A. Cunningham (N.W. Coast), Gregory (Nichol Bay), Warburton (towards Spencer's Gulf), curiously enough failing to mention Sturt—"I have seen are most of them very incomplete, and those described by R. Brown unfortunately mislaid" [at the Museum]. One suspects here a merely cursory search, for the specimen has long been in its place among the species of *Tribulus*. It is to this that Bentham's error is due, as the plant he understands as *T. Hystrix* is obviously not that of Brown.

A few further details about *T. Hystrix* may now be given :—

Planta saltem bispithamea indumento dilute fulvo obtecta. *Caulis* erectus, sparsim ramosus, sat validus. *Foliola* basi obliqua necnon aliquantulum cordulata, pleraque 8–10 mm. long., 4–5 mm. lat. *Stipulæ* lanceolato-triangulares, circa 5 mm. long. *Pedicelli* 2·5–3·5 cm. *Flores* pansi ægre 5 cm. diam. *Sepala* lineari-lanceolata, 13 mm. long. *Petala* obovata, circiter 2·5 cm. long. *Fructus* fere 3·5 cm. diam.: hujus spinæ longiores adusque 15 mm., breviores ± 5 mm. long.

After describing *T. Hystrix*, Brown (*l. c.*) continues :—

"Obs. 1. A species nearly related to *T. Hystrix*, found on the west coast of Australia, or on some of its islands, in the voyage of the 'Beagle,' may be distinguished by the following character. *Tribulus* (*occidentalis*) sericeo-lanatus, foliis suboctojugis, coccis undique densè armatis: spinis omnibus conico-subulatis longitudine invicem æqualibus. These two species differ from all others in the uniform shape of the spines, which equally cover the whole external surface of the fruit." (Pl. **11**. A. fig. 2.)

Bentham (*l. c.*) merges *T. occidentalis* in *T. Hystrix* "from the short diagnosis given," although doubt might well have entered his mind at this point, since, while the specimens he considers to represent *T. Hystrix* have flowers "smaller than in *T. cistoides*," Brown expressly says that that species has "flores magni," and the floral difference should have led him, irrespective of Brown's reputation, to suspect difference in the fruit. Unfortunately the type of *T. occidentalis* has been mislaid at the Museum, but material there (North Goulburn Island; *A. Cunningham*: N.W. Coast; *Id.* 133 of 1818 coll.: N.W. Coast; *De Bouley*), with one small exception to be noticed soon, agrees with Brown's description, as also with material at Kew authenticated in Bentham's handwriting as the writer's conception of *T. Hystrix*. Flower and fruit apart, the two species (*Hystrix* and *occidentalis*) are very like one another, the flowers of *occidentalis* being much smaller and the fruits clearly different. As contrasted with similar organs of *T. Hystrix*, the following points may be mentioned:—*Pedicelli* 1·5–2·5 cm. long. *Flores* pansi 2·5 cm. diam. *Sepala* lineari-lanceolata, 8 mm. long. *Petala* obovata, 13 mm. long. *Fructus* summum modo 2 cm. diam.; horum spinæ inter sese parum inæquales, sc. longiores 8 mm. breviores 5 mm. long.

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* Append. Sturt Exped. Cent. Austral. p. 69; reprinted in R. Brown's Misc. Bot. Works, i. p. 318.

† Fl. Austral. i. p. 289.

Bentham's *T. Hystrix* may thus safely be considered to be conspecific with Brown's *T. occidentalis*, the slight and not at all obtrusive inequality in the spines on the fruit having evidently been overlooked by Brown when drawing up his description.

The *T. Hystrix* referred to by Mueller * as collected by Giles at Lake Amadeus may perhaps be the true plant of Brown, as he notes its having petals sometimes an inch long; but the material cannot have been in ripe fruit, or Mueller would not have considered it (*l. c.*) as conspecific with a Dampier Archipelago (*i.e.* N.W. Coast) plant of Hughan and Walcott, which is almost certainly *T. occidentalis*. That Mueller did not know the difference between *Hystrix* and *occidentalis* is clear from his giving † West, South, and North Australia for the distribution of *T. Hystrix*, which, so far as known, is a Central Australian desert species.

Two very small specimens at Kew from Central Australia (*Gosse* 230 and *Babbage* 7) may perhaps belong to *T. Hystrix*, but they are in flower only.

The Australian species of *Tribulus* and *Eutribulus* may be tabulated as follows:—

I. Cocci of fruit winged and without prickles.	
Glabrous or nearly so. Cocci smooth between the wings	*T. platypterus*, Benth.
Hirsute. Cocci reticulate between the wings	*T. hirsutus*, Benth.
Cocci of fruit winged and provided with conical prickles.	
Fruit prominently angled	*T. macrocarpus*, F. Muell.
Fruit rounded	*T. Forrestii*, F. Muell.
II. Wingless cocci provided with prickles.	
Prickles few, short, more or less conical.	
Annual. Flowers small	*T. terrestris*, Linn.
Perennial. Flowers 3·5–4 cm. in diameter	*T. cistoides*, Linn.
Annual. Flowers upwards of 2 cm. in diameter .	*T. ranunculiflorus*, [F. Muell.
Prickles numerous, subulate or conico-subulate.	
Flowers large. Fruit nearly 3·5 cm. across	*T. Hystrix*, R. Br.
Flowers of medium size. Fruit up to 2 cm. across	*T. occidentalis*, R. Br.

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* Frag. Phyt. Austral. xi. p. 30.

† Sec. Cens. Austral. Pl. p. 22.

The plants of Captain Sturt, a name perhaps better known now in connection with the Sturt Pea (*Clianthus Dampieri*, A. Cunn.) than as that of an explorer, were collected during his second expedition into the interior of South Australia, 1844–6. As examined by Robert Brown, the collection comprised only about a hundred species, of which Brown described six and twenty. A large proportion of those left unnoticed were too unsatisfactory for description; but here and there will be found a specimen sufficiently good for naming, and very occasionally so, as a new species, of which statement an instance will be given hereafter (*vide* p. 210).

II. Some New or Rare West Australian Plants
from the recent Collections of Dr. F. Stoward and Mr. J. E. C. Maryon.
(Plate **12**. A).

Dr. F. Stoward, of Leederville, near Perth, has sent from time to time a large number of specimens to the Museum. His range of opportunity has been extensive, and the result of his efforts is correspondingly important. The chief localities are Kununoppin, 130 miles E. by N. from Perth, Nungarin, Bruce Rock, Mount Marshall, Wongan Hills, and Cowcowing, the three last from 100 to 150 miles N.E. from the capital, besides places on or near the railway to Southern Cross and a few farther south. In addition he sends from his herbarium many plants found by Mr. G. W. Brown at Kauring, near Greenhills *. Although much smaller than the above, Mr. Maryon's collection, from Mulline with a few from Mount Magnet, in the Murchison Goldfield, has several examples of new or rare species, one of which, the remarkable *Bellida major*, will be found described and figured in the 'Journal of Botany,' lv. (1917) p. 100, tab. 547. The sequence of natural orders, it may be added, followed in this memior, is that of the 'Flora Australiensis,' a linear sequence in the present state of our knowledge being thought preferable to more ambitious arrangements based upon a highly speculative phylogeny.

DILLENIACEÆ.

Hibbertia (§ *Hemistemma*) pullula, sp. nov. Verisimiliter suffrutex crebro ramosus, *ramis* subteretibus cortice cinereo in longitudinem exuto glabro cinctis; *foliis* parvis sessilibus lineari-oblongis obtusis apice parum recurvis margine arcte revolutis secus marginem falsum tuberculatis ceterum glabris; *floribus* ad apicem ramulorum solitariis pedunculatis pedunculis glabris folia subæquantibus; *sepalis* ovatis vel oblongo-ovatis obtusis nisi obtuse acutis concavis dorso carinulatis glabris; *petalis* sepala excedentibus obcordatis; *staminibus* 10 antheris obtusis cum staminodiis lineari-spathulatis vix totidem conversatis; *carpellis* 2 lanatis, 2-ovulatis.

Ongerup district; *Stoward*, 842, 843.

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* The Stoward numbers, it should be noted, refer only to Museum material. Identical species will often be found at Kew under another number and different species under the same number.

Folia 2·5–7 mm. long., circa 1 mm. lat., griseo-viridia; costa centralis pag. inf. maxime prominens. Pedunculi circa 4 mm. long. Sepala 3·5–4·5 mm. long. Petala 6 × 5 mm. Stamina 2 mm., staminodia 1·5 mm. long. Carpella subglobosa circa 1 mm. diam. Styli subrecti, 1·5 mm. long.

Differs from *H. verrucosa*, Benth. chiefly in the smaller much less warted leaves and the small flowers with glabrous calyx.

HIBBERTIA (§ *Pleurandra*) STOWARDII, sp. nov. Suffrutex; *ramis* erectis ramulos sat approximatos abbreviatos crebro foliosos minutissime puberulos sustinentibus; *foliis* erectis subsessilibus lineari-oblongis apice pungenti-mucronatis margine arcte revolutis opacis minute scabriusculis; *floribus* ad apicem ramulorum subsessilibus bracteis perpaucis ovatis vel ovato-oblongis obtusis acutisve interdum breviter pungentibus stipatis; *sepalis* ovatis obtusis concavis nisi apice breviter pungenti glabris; *petalis* sepala superantibus bilobis; *staminibus* 10 antheris retusis; *carpellis* 2 lunatis; *ovulis* pro loculo 2.

Kununoppin; *Stoward*, 727.

Folia 5–12 mm. long., summum 1·5 mm. lat. vel paullulum ultra; costa media pag. inf. optime aspectabilis, pag. sup. haud visa. Bracteæ 2·5–3 mm. long. Sepala circa 5 mm. long. Petala undulata, 8·5 mm. long.; horum lobi rotundati, 2 mm. long. Stamina 2·25 mm. long. Carpella subglobosa, circa 1 mm. diam. Styli incurvo-erecti, 1·25 mm. long.

H. mucronata, Benth. has hairy young branches, somewhat narrower shining leaves with longer pungent points, narrower subulate bracts, hairy sepals, the outer ones with a long pungent point, and about 5 stamens.

H. rostellata, Turcz. Nungarin; *Stoward*, 410. Bruce Rock; *Id.*, 471.

CANDOLLEA RUPICOLA, sp. nov. Verisimiliter suffrutex crebro ramosus; *ramis* ascendentibus puberulis deinde glabris ramulos perbreves copiose emittentibus; *foliis* in ramulis confertis sessilibus linearibus apice mucronulatis margine arcte revolutis glabris; *floribus* sessilibus ramulos terminantibus; *sepalis* ovatis concavis 3 longe 2 breviter acuminatis glabris; *petalis* sepala subæquantibus late obovatis bifidis; *staminibus* 11 quorum 3 in fasciculos triandros digestis; *carpellis* 3 glabris in stylum longiorem excurrentibus.

Bruce Rock; *Stoward*, 430.

Folia 5–9 mm. long., ·5–·75 mm. lat. Sepala 7 mm. long.; horum acumen longum 3–3·5 × ·5 mm., breve summum 1 mm. long. Petala 6·5 mm. long., margine minute undulato-crenulata. Stamina 3 mm. long.; antheræ oblongæ, retusæ, 2 mm. long. Carpella compressa, ambitu ovoideo-oblonga, 1·25 mm. long. Styli divaricati, 2 mm. long.

Differs from *C. teretifolia*, Turcz. chiefly in the markedly revolute leaves, the absence of orbicular bracts at the base of the flowers, and the acuminate sepals.

PORTULACACEÆ.

Calandrinia Maryonii, sp. nov. Planta glabra; *rhizomate* brevi lignoso caules multos graciles repentes emittente; *foliis* paucis haud fasciculatis linearibus vel lineari-oblongis nisi oblongis obtusis crassiusculis; *racemis* laxe plurifloris; *bracteis* sat perspicuis ovatis membranaceis; *floribus* pedicellis brevibus ascendentibus post floritionem vero elongatis pendentibusque insidentibus; *sepalis* late ovatis obtusis obscure nervosis; *petalis* 6 oblanceolato-oblongis obtusis sepala paullulum excedentibus; *staminibus* 5–6 filamentis compressis ima basi dilatatis; *ovario* oblongo-ovoideo stylis 4 sat elongatis coronato; *capsula* sepala breviter superante subcylindrica (superne leviter attenuata) valvis 4 brevibus dehiscente.

Mulline; *Maryon*.

Caules longit. 20 cm. attingentes sed sæpissime breviores, simplices vel ramosi ramis patentibus. Folia 1 cm. long., inferiora viridia (in sicco fuscescentia), superiora latiora, in sicco brunneo-rubra. Bracteæ circa 2 mm. long., deorsum caulem basi amplectentes. Pedicelli plerique 2-3 mm. long., sub fructu 5–7 mm. Sepala sub flore 4 mm., sub fructu 5 mm. long. Petala 5·5 mm. long., paullo post floritionem calyptram capsulam obtegentem efformantia. Capsula 5–6 mm. long.; hujus valvæ late oblongæ, obtusissimæ, ·75 mm. long. Semina circa 25, ·5 mm. diam.

Apparently nearest *C. calyptrata*, Hook. f., which is a plant of slenderer habit with much smaller bracts, and small flowers with three short stigmas and a three-valved capsule, the valves longer and differently shaped.

STERCULIACEÆ.

Commersonia Stowardii, sp. nov. Verisimiliter frutex nisi suffrutex scabro-tomentosus; *ramulis* ultimis brevibus crebro foliosis; *foliis* parvis petiolatis late ovatis apice rotundatis basi leviter cordatis interdum obliquis margine integris vel undulatis pag. sup. cito scabridis: *cymis* subsessilibus paucifloris quam folia brevioribus flores parvos foventibus; *sepalis* oblongo-ovatis obtusis quam petala panduriformia apice late rotundata longioribus; *staminodiis* lateralibus anguste filiformibus ultra medium staminodii intermedii oblongo-spathulati attingentibus filamentis staminum basi adhærentibus; *ovarii* loculis ovulis 3 præditis; *stylis* inter se liberis.

Nungarin; *Stoward*, 287.

Folia ±10×8 mm.; petioli 3–6 mm. long. Cymæ circa 7 mm. diam. Flores verisimiliter albi, 5 mm. diam. Sepala 2·5 mm. long. Petala 2 mm. long. Filamenta crassiuscula, ·75 mm. long.; antheræ oblongæ, ·8 mm. long. Staminodium intermedium 1·5 mm. long.; lateralia circa 1 mm. Ovarium globosum, 5-sulcatum, molliter tomentosum, 1 mm. diam. Styli fere ·5 mm. long.

Nearest *C. pulchella*, Turcz., which has narrower toothed or lobed leaves, larger flowers with rotundate sepals, petals in several respects different and with larger central staminodes, the lateral ones shorter and broader.

Thomasia macrocalyx, Steud. Kauring; *G. W. Brown* (Hb. Steward, 513).

T. sarotes, Turcz. Belka; *Steward*, 350.

Lysiosepalum Barryanum, F. Muell. Wagin-Katanning district; *Steward*, 7.

L. rugosum, Benth. Kununoppin; *Steward*, 400.

RUTACEÆ.

BORONIA (*Variabiles*) FOLIOSA, sp. nov. Suffrutex vel frutex ramosus; *ramis* crebro foliosis subtretragonis minute furfuraceis dein glabris; *foliis* subsessilibus oblongis obtusis basin versus aliquanto angustatis glabris; *floribus* axillaribus solitariis breviter pedicellatis pedicellis basi bracteis exiguis perpaucis stipatis uti sepala minute pubescentibus; *sepalis* oblongo-triangularibus obtusis; *petalis* sepala excedentibus anguste ovatis obtusis extus minute tomentellis; *filamentis* aliquanto compressis alternis longioribus inferne ciliatis sursum papillosis antheris inter se similibus apiculo parvo recurvo onustis; *carpellis* liberis pubescentibus; *seminibus* albis glabris.

Bruce Rock; *Steward*, 334. Totadjen; *Id.*, 356. Nungarin; *Id.*, 412.

Folia ± 10 mm. long., 2–4 mm. lat., in sicco flaveolo-viridia. Pedicelli 1·5–2 mm. long.; horum bracteæ summum 1 mm. long. Sepala 2 mm. long. Petala 5 mm. long., verisimiliter dilute rosea. Filamenta 1·5–2 mm. long.; antheræ ovoideæ, ·75 mm. long. Semina subreniformia, 2·5 mm. long.

This seems nearest *B. crassipes*, Benth., a species with, *inter alia*, longer and narrower leaves, much larger flowers with different sepals, and petals glabrous on the back.

Phebalium microphyllum, Turcz. Bruce Rock; *Steward*, 473.

P. filifolium, Turcz. Mt. Marshall; *Steward*, 325.

PHEBALIUM CAPITATUM, sp. nov. *Ramulis* tenuibus subsparsim foliosis glandulis prominentibus sphæroideis subpellucidis copiose instructis primo minutissime fusco-furfuraceis dein glabris; *foliis* parvis sessilibus crassis linearibus obtusis ob margines revolutos subtus canaliculatis glandulis paucis prominenter tuberculatis glabris; *floribus* sessilibus ad apicem ramulorum capitatis capitibus plerumque 3–4-floris bracteis circa 4 ovatis obtusis fusco-furfuraceis cinctis; *sepalis* parvulis ovatis obtusissimis puberulis; *petalis* oblongo-ovatis acutis æstivatione valvatis glabris; *staminibus* exsertis

filamentis filiformibus glabris antheris inappendiculatis; *carpellis* ovoideis obtusis furfuraceis; *stylo* elongato glabro.

Bruce Rock; *Stoward*, 437.

Folia pleraque 5 × ·6 mm., in sicco viridia. Bracteæ circa 1 mm. long. Sepala ·5 mm. long. Petala probabiliter alba, fere 3 mm. long. Filamenta 4 mm., antheræ ·5 mm. long. Carpella 1 mm., stylus 5 mm. long.

The prominently glandular branches together with the tubercular leaves and small capitate inflorescences are the chief marks of this species.

Phebalium deserti, comb. nov. (*Eriostemon deserti*, E. Pritz. in Engl. Bot. Jahrb. xxxv. (1904) p. 320). Bruce Rock; *Stoward*, 314.

ERIOSTEMON STOWARDII, sp. nov. Ex conjectura frutex, multiramosus, subtilissime griseo-pubescens; *ramulis* teretibus sat gracilibus bene foliosis; *foliis* parvulis teretibus clavatis tuberculis paucis glandulosis leviter eminentibus præditis; *floribus* 5-meris subsessilibus solitariis terminalibus raro axillaribus; *sepalis* parvis deltoideis apice glandula fusca onustis; *petalis* sepala longe superantibus oblongo-ovatis obtusis dorso obtuse carinatis pubescentibusque; *filamentis* compressis basi apiceque ciliatis alibi glabris antheris in apiculum latum desinentibus; *carpellis* rostratis pilosis; *stylo* juxta basin carpellorum inserto filiformi leviter puberulo.

Trayning; *Stoward*, 291. Nungarin, *Id.*, 794.

Folia 1·5–2·5 mm. long., 1 mm. diam., in sicco griseo-viridia. Pedicelli 2 mm. long. Sepala 1·25 mm. long. Petala verisimiliter alba, 4·5 × ægre 2 mm. Filamenta 3 mm. long., antheræ ovatæ, loculi ·6 mm. apiculus ·5 mm. long. Carpella 1·5 mm., stylus 2·25 mm. long.

Nearest to *E. tomentellus*, Diels, which according to figure and description has tomentose indumentum, larger leaves, flowers on longer peduncles, with a larger calyx, broader rose-coloured petals, filaments ciliated (apparently throughout), and tomentose carpels.

ERIOSTEMON THRYPTOMENOIDES, sp. nov. Probabiliter frutex, crebro ramosus, glaber; *ramulis* tenuibus bene foliosis; *foliis* parvulis clavatis teretibus breviter tuberculoso-glandulosis; *floribus* terminalibus (anne semper?) subsessilibus; *sepalis* ovatis in glandulam magnam viridem se contrahentibus; *petalis* ovato-oblongis obtusis margine ciliatis dorso puberulis carinatisque; *filamentis* late complanatis omnimodo ciliatis antheris breviter apiculatis; *carpellis* liberis obtusis apice barbatis; *stylo* crasso superne attenuato dense pubescente sub apice glabro.

Nungarin; *Stoward*, 784.

Folia ±1·5 mm. long., ·75 mm. diam., in sicco viridia. Pedicelli crassi, 1·5 mm. long. Sepala 2 mm. long. Petala verisimiliter dilute rosea, 5 × 1·5–2 mm. Filamenta 3 mm., antheræ ·45 mm. long. Carpella ·75 mm. long. Stylus 3 mm. long.

Distinguished from *E. Stowardii* by the absence of hairiness, the smaller narrower less markedly tubercled leaves, the larger sepals, broad filaments copiously hairy throughout tipped by smaller anthers with but a tiny apiculus, the smaller obtuse carpels and stout pubescent style.

The two plants here described, as well as *E. tomentellus*, Diels, are doubtless allied to *E. difformis*, A. Cunn.

LEGUMINOSÆ.

OXYLOBIUM EMARGINATUM, sp. nov. Verisimiliter fruticulosum; *ramis* teretibus subtiliter cinereo-pubescentibus dein glabris; *foliis* verticillatis (pro verticillo 3) nonnunquam oppositis parvis brevipetiolatis obcordato-oblongis basi obtusis margine induratis obscureque crenulatis coriaceis supra cito glabris subtus appresse griseo-pubescentibus; *stipulis* setaceis petiolos excedentibus; *floribus* in glomerulos plurifloros densos terminales sessiles dispositis; *calycis* fulvo-villosi segmentis oblongo-ovatis obtusis 2 posticis paullulum altius connatis; *vexillo* suborbiculari emarginato alis apice rotundatis carinam leviter excedentibus; *ovario* breviter stipitato villoso in stylum longiorem incurvum basi barbatum desinente; *ovulis* 4.

Kojonup; *Stoward*, 105.

Folia ±1 cm. long., prope apicem 6–8 mm. lat., in sicco griseolo-viridia; costa media supra plana subtus eminens; costæ laterales perpaucæ, obscuræ; reticulum minutum, mediocriter visibile; petioli 1–2 mm. long. Stipulæ 3 mm. long. Glomeruli 1·5–2 cm. diam. Calyx 7 mm. long, hujus segmenta postica 2·5 mm. cetera 3 mm. long. Vexillum (ungue 3 mm. long. exempto) 7×8 mm.; alæ 9 mm., carina 8 mm. long. Ovarium 2 mm. long.; hujus stipes ·5 mm. Stylus circa 5 mm. long.

This is not placeable in any of the series of Bentham. It is evidently near *O. tetragonophyllum*, E. Pritz., a species the describer assigns doubtfully to series *Podolobieæ*, a step it is difficult to follow.

Var. MAJOR. Folia plerumque opposita raro verticillata, ± 2 cm. long., petiolis usque 3 mm. long. Glomeruli ob ramulorum suppressionem nonnunquam axillares. Kojonup; *Stoward*, 806.

Dr. Stoward suggests that this may be merely a more luxuriant specimen of the species, but it looks sufficiently different to warrant a varietal name.

Mirbelia daviesioides, Benth. Bruce Rock; *Stoward*, 308. Cowcowing; *Id.*, 402.

BURTONIA ASPERULA, sp. nov. Probabiliter suffrutex; *ramis* pluribus tenuibus arrectis frequenter foliosis hispidulo-pubescentibus; *foliis* brevipetiolatis pinnatis foliolis plerumque 5 vel 7 anguste linearibus obtusis ob margines revolutos subteretibus uti rhachis hispidulis; *floribus* purpureis pro rata

parvis in racemos terminales pedunculatos breves paucifloros digestis; *pedicellis* sepalis subæquilongis glabris bracteas subulatas facile excedentibus; *bracteolis* bracteis similibus sub calyce insertis; *sepalis* lanceolato-oblongis obtusis margine induratis necnon lanoso-ciliatis ceteroquin glabris vel fere glabris; *petalis* calycem paullo excedentibus; *ovario* sessili; *legumine* calyci persistenti æquilongo late ovoideo subperspicue reticulato-nervoso microscopice puberulo stylo persistente oblique inserto basi incrassato glabro coronato.

Wongan Hills; *Stoward*, 194.

Foliorum rhachis circa 1·5 mm. long.; petiolus 1 mm. vel paullulum ultra; foliola 3–4 mm. long. Pedunculi superne glabri, plerique 2·5–3·5 cm. long. Bracteæ bracteolæque 1–1·5 mm. long. Calyx in sicco aliquanto fuscus, 5 mm. long. Petala 7 mm. long. Antheræ oblongæ, 1 mm. long. Legumen 4·5 mm. long. et totidem lat.

Though not in the best condition, the material suffices to indicate this as a distinct species. The chief points are the clothing and the few small leaflets, together with the small flowers and smooth calyx.

Daviesia nematophylla, F. Muell. Totadjen; *Stoward*, 362.

DAVIESIA PHYLLODINEA, sp. nov. *Ramis* erectis rigidis sparsim foliosis angulatis leviter scabriusculis; *foliis* sessilibus lineari-oblongis linearibusve apice mucronatis coriaceis utrobique leviter scabriusculis; *floribus* breviter pedicellatis in fasciculos axillares paucifloros ordinatis glabris; *pedicellis* bracteas parvas oblongas scariosas foventibus; *calycis* dentibus triangularibus acutis posticis paullulum latioribus; *vexillo* reniformi emarginato alis late oblongis apice rotundatis carinam obtusam paullulum excedentibus; *filamentis* compressis; *ovario* breviter stipitato fusiformi glabro; *stylo* recurvo glabro.

Belka; *Stoward*, 352.

Folia sæpissime 2–4 cm. long., 2–4 mm. lat.; costa media subtus eminens; reticulum rugulatum. Pedicelli 2–3 mm. long., bracteæ 1–fere 2 mm. long. Calyx 3 mm. long., hujus dentes 1 mm. Vexillum 6 × 7 mm.; alæ 6 mm., carina 4·5 mm. long. Ovarium 3 mm., stipes 1 mm., stylus 2 mm. long.

Var. PARVIFOLIA. A typo discrepans præsertim de habitu tenuiori necnon confertiori foliisque parvis (1·5–2 cm. long., 1·5–2 mm. lat.). Bruce Rock; *Stoward*, 469.

Near *D. nudiflora*, Meissn., which has larger and broader leaves ending in long pungent points, flowers on longer pedicels thickened in their upper portion, calyx with the two hinder teeth united &c.

DAVIESIA PARVIFOLIA, sp. nov. Planta inermis, glabra; *ramis* ramulisque subteretibus elevato-striatis bene foliosis; *foliis* parvulis sessilibus oblongo-lanceolatis apice longe pungentibus margine revolutis coriaceis; *floribus*

axillaribus sessilibus pedicellatis; *bracteis* minutis ovatis scariosis; *calycis* turbinati dentibus inter se subæqualibus deltoideis obtusis; *vexillo* reniformi alte emarginato alis oblongo-obovatis obtusissimis vexillum carinamque adæquantibus; *filamentis* aliquantulum compressis; *ovario* oblongo-falcato stipitato glabro quam stylus longiore; *legumine* a basi lata falcato acuminato.
Kauring; *G. W. Brown* (Hb. Stoward, 560).

Ramuli patentes, sæpius 3–5 cm. long. Folia ramorum usque 1 cm. long., ramulorum modo 3·5–4·5 mm., in sicco viridia. Pedicelli sub flore 1·5 mm., sub fructu 3–5 mm. long. Bracteæ 1 mm. long. Calyx 3 mm. long.; hujus dentes ·5 mm. Vexillum 4·5 × 5 mm. Ovarii stipes 1 mm., ovarium 3 mm., stylus 1 mm. long. Legumen 12 × 8 mm.; hujus stipes 2 mm. long.

As regards foliage much like the eastern *D. ulicina*, Sm., var. *ruscifolia*, Benth., but the branches are not spinous, the leaves are smaller, and the pod is broader.

D. JUNCEA, Sm., *var.* SPINESCENS, var. nov. *Rami* hac atque illac spinis firmis plerumque patenti-recurvis 3–5 mm. long. onusti: characteres ceteri typi. Wickepin; *Stoward*, 108. Wundowie; *Id.*, 261. Kauring; *G. W. Brown* (Hb. Stoward, 572).

GASTROLOBIUM STOWARDII, sp. nov. Fruticosum, ramosum; *ramis* rigidis subteretibus griseo-tomentosis postea glabris flavescentibusque; *foliis* oppositis subsessilibus oblongo-obovatis apice obtusissimis vel retusis ipso mucronatis basi obtusis margine induratis aliquantulum revolutis obscurissime crenulatis coriaceis supra cito glabris nitidisque subtus griseo-pubescentibus; *stipulis* subulatis acuminatis tomentosis; *floribus* in axillis paucis fasciculatis breviter pedicellatis; *calycis* tomentosi segmentis triangularibus acutis posticis quam cetera paullulum latioribus altiusque connatis; *vexillo* suborbiculari alis obtusissimis carinæ æquilongis; *ovario* ovoideo villoso stipite æquilongo fere glabro suffulto; *stylo* incurvo inferne pubescente superne glabro.
Dumbleyung; *Stoward*, 106.

Folia solemniter 1–1·5 cm. long., prope apicem 5–8 mm. lat., in sicco griseolo-viridia; costa centralis pag. sup. impressa, pag. inf. eminens; costæ laterales perpaucæ, difficile aspectabiles; reticulum arctissimum utrinque prominens. Stipulæ 3 mm. long. Pedicelli 2–3 mm. long. Calyx totus 5·5 mm. long.; segmenta postica 1·5 mm., cetera 2·5 mm. long. Vexillum 7 × 6 mm.; alæ necnon carina 7 mm. long. Ovarium (stipite excluso) 2 mm. long.; stylus 4 mm. long.

Apparently nearest *G. plicatum*, Turcz., but, *inter alia*, much smaller in the leaf pubescent below (not glabrous) and smaller tomentose (not villous) calyx.

GASTROLOBIUM SPINOSUM, Benth., *var.* MICROPHYLLUM, var. nov. *Folia* parva, lanceolato-hastata lobis lateralibus rotundatis inermibusque vel spinula debili præditis, 14–17 mm. long., juxta basin 5–7 mm. lat. Kauring; *G. W. Brown* (Hb. Stoward, 554).—*Var.* INERME, var. nov. *Folia* cordato-lanceolata, omnino integra, 20–25 mm. long., 10–12 mm. lat. Woodanilling; *Stoward*, 721.—*Var.* TRILOBUM, var. nov. *Folia* parva late cordato-ovata 3-(rarissime 5-) loba lobis in spinulam rigidiusculam exeuntibus ±14×13 mm. Kauring; *G. W. Brown* (Hb. Stoward, 551, 632).

GASTROLOBIUM SAGITTULATUM, sp. nov. Planta ramosa, *ramulis* subtetragonis puberulis cito glabrescentibus; *foliis* oppositis brevipetiolatis lineari-lanceolatis apice pungentibus basi rotundato-sagittulatis aliquanto decurrentibus coriaceis glabris; *stipulis* setaceis firmis petiolis æquilongis; *racemis* folia excedentibus paucifloris floribus approximatis distantibusve; *bracteis* parvis ovatis longe acuminatis; *calycis* segmentis ovato-oblongis acuminatis margine lanuloso-ciliatis 2 posticis altius connatis; *vexillo* reniformi-orbiculari alis obtusissimis carinæ æquilongis; *ovario* anguste ovoideo villoso stipiti sat crasso sibi ipsi æquilongo insidente; *stylo* incurvo lateraliter compresso inferne barbato ceterum glabro.

Kauring; *G. W. Brown* (Hb. Stoward, 562).

Folia pleraque 2·5–4·5 cm. long., medio 3–3·5 mm. basi 6 mm. lat., in sicco pallide viridia; costa centralis pag. inf. maxime eminens; costæ laterales 0 vel obscurissimæ; reticulum arctissimum, pag. utravis optime aspectabile; petioli 2 mm. long. Stipulæ 2 mm. long. Racemi graciles, 5–8 cm. long. Bracteæ fugaceæ, absque acumine 1·5 mm. long., acumen ipsum 2 mm. long. Pedicelli ± 3 mm. long. Calyx 11 mm. long.; hujus lobi postici 3·5 mm., antici 6 mm. long. Vexillum 13×15 mm., hujus unguis 3 mm. long.; alæ 11 mm. long. Ovarium (stipite exempto) 3 mm. long. Stylus 7 mm. long.

Very close to *G. calycinum*, Benth., from which it differs chiefly in the narrow leaves markedly expanded at the base, the small inconspicuous bracts, somewhat smaller flowers, smaller calyx with shorter and relatively broader segments, and style bearded in its lower half.

GASTROLOBIUM FLORIBUNDUM, sp. nov. *Ramis* rigidis subteretibus glabris in sicco flavidis; *foliis* oppositis brevipetiolatis lineari-lanceolatis apice obtusis ipso pungentibus basi obtusis saltem in sicco concavis coriaceis glabris; *stipulis* setaceo-subulatis petiolos superantibus; *racemis* axillaribus vel terminalibus folia adæquantibus tenuibus plurifloris puberulis; *calycis* piloso-pubescentis segmentis posticis altius connatis rotundatis quam cetera ovata acutiuscula latioribus; *vexillo* suborbiculari; *ovario* ovoideo dense villoso breviter stipitato; *stylo* incurvo glabro.

Nungarin; *Stoward*, 730.

Folia 4–6 cm. long., 4–5 cm. lat., in sicco flavo-viridia; costa centralis pag. inf. valde prominens; costæ laterales plures in reticulum arctissimum utrobique optime visibile transeuntes; petioli 3 mm. long. Stipulæ fuscæ, 4 mm. long. Racemi 5–7 cm. long. Pedicelli 2 mm. long., piloso-pubescentes. Calyx 4–5 mm. long.; lobi postici 1 mm., reliqui 1·5 mm. long. Vexillum 8·5×8 mm., carina 7 mm. long. Ovarium 3 mm., hujus stipes 1·5 mm. long. Stylus 1·5 mm. long.

Flowers in several respects like those of *G. microcarpum*, Meissn., but foliage altogether different. The flowers are in an advanced state and their corollas not well seen in consequence.

Gastrolobium crassifolium, Benth. Wagin-Katanning district; *Stoward*, 9.

Phyllota Georgii, Hemsl. Trayning; *Stoward*, 330. Totadjen, *Id.*, 357.

Swainsona colutoides, F. Muell. Trayning; *Stoward*, 109 (det. A. J. Ewart).

CASSIA (§ *Psilorhegma*) STOWARDII, sp. nov. *Ramulis* tetragonis minute puberulis dein glabris; *foliis* petiolatis foliolis solemniter 10 subsessilibus lineari-oblongis obtusis coriaceis minute puberulis rhachi sat tenera glandulis interjugalibus exiguis fuscis obsita; *stipulis* subulatis acutis; *racemis* pedunculatis umbelliformibus paucifloris pedicellis calyce longioribus uti pedunculus sparsim pubescentibus; *sepalis* inter sese subsimilibus ovatis obtusis dorso sparsim pubescentibus; *petalis* similibus oblongo-obovatis margine undulatis; *staminibus* 10 omnibus antheriferis antheris late oblongis obtusis 2 anticis quam ceteræ paullo majoribus; *ovario* stipitato falciformi glabro.

Mt. Marshall; *Stoward*, 386.

Foliorum rhachis 17–28 mm. long., ægre ·5 mm. crass.; foliola in sicco viridia, 10–15 × 1·5–2 mm.; petiolus usque ad 5 mm. long., petioluli 1 mm. nisi minus. Stipulæ 1·5 mm. long. Pedunculi et pedicelli circa 5 mm. long. Sepala 2–2·5 mm., petala 7 mm. long. Filamenta ·5–1·5 mm. long.; antheræ majores 3 mm. minores 2–2·75 mm. long. Ovarium 5 mm. (stipite 1 mm. excluso), stylus circa 1 mm. long.

This might perhaps be included within the limits of *C. Sturtii*, R. Br., as understood by Bentham; but on comparing it with Sturt's type in the British Museum (which seems to have escaped Bentham's notice, as he mentions Sturt only under the hypothetical var.? *coccinea*), the idea of conspecificity must be abandoned, so different are the two plants. The var.? *coriacea* (to which may be referred the plant entered as *C. Sturtii* in Journ. Linn. Soc. xxxiv. p. 188) also seems deserving of specific rank.

ACACIA (*Pungentes*) PERICULOSA, sp. nov. Fruticosa, glabra, inermis; *ramis* robustis patentissimis, phyllodiorum fulcimentis optime exstantibus signatis; *phyllodiis* patentibus subteretibus linearibus apice acute pungentibus ima basi aliquantulum dilatatis rigidissimis subtilissime plurinervibus;

glomerulis sat longe pedunculatis oblongo-globosis paucifloris in axillis solitariis vel 2–3-nis; *floribus* 5-meris; *sepalis* inter se liberis anguste lineari-spathulatis quam petala libera oblongo-obovata obtusa brevioribus; *legumine* valde crudo anguste lineari incurvo vel torto appresse puberulo.

Nungarin; *Stoward*, 753.

Rami 2–3 mm. crass., cortice tenero cinereo laminatim decidente obducti. Phyllodia 1·5–2·5 cm. long., 1 mm. vel paullulum magis lat., in sicco flavo-viridia. Pedunculi 1–1·5 cm. long., filiformes. Glomeruli axis 2–3 × 1–1·25 mm. Sepala 1 mm., petala 1·5 mm. long. Legumen maxime crudum 15 × ·75 mm., fuscum.

At first sight might be mistaken for *A. colletioides*, A. Cunn., but the stouter phyllodes of *A. periculosa* are more finely nerved and the flowers are in more lengthily pedunculate not strictly globose heads. There are differences also in the flowers and probably also in the fruit.

Acacia (*Calamiformes*) assimilis, sp. nov. Citissime glabra novellis appresse pubescentibus; *ramulis* tenuibus cinereis politis; *phyllodiis* anguste linearibus subteretibus apice debiliter uncinato-pungentibus basi stipiti manifesto transverse rugato flavo insidentibus plurinervosis; *stipulis* subulatis fugaceis; *floribus* 5-meris; *sepalis* liberis lineari-spathulatis quam petala libera spathulato-oblonga obtusa paullo brevioribus; *legumine* ——.

Bruce Rock; *Stoward*, 116. Cowcowing; *Id.*, 405.

Phyllodia 5–8 cm. long., summa equidem breviora, 1 mm. lat.; horum stipes attenuatus, 2·5 mm. long. Stipulæ 1·5 mm. long. Pedunculi 4–6 mm., sepala 1 mm., petala 1·5 mm. long.

Very like and might easily be confused with *A. uncinella*, Benth. The numerous fine nerves to the phyllodes and their longer, slenderer, yellow petiole-like stalks afford an easy means of distinction. *A. Beauverdiana*, Ewart, is also very similar, but its phyllodes, which have the same yellow stalks, are flat, not terete.

A. Beauverdiana, Ewart. Cowcowing; *Stoward*, 311, 453. Bruce Rock; *Id.*, 312, 449.

A. erinacea, Benth. Kauring; *G. W. Brown* (Hb. Stoward, 573).

Acacia (*Uninerves*) intricata, sp. nov. Verisimiliter fruticulus intricate ramosus glaber; *ramis* rigidis apice induratis sæpeque breviter spinosis angulatis prominenter paucistriatis; *phyllodiis* parvulis lateraliter complanatis a basi sessili lata ovatis vel ovato-oblongis apice acute pungentibus margine superiori incrassatis marginibus ambobus anguste cartilagineis uninervibus nervo utrobique prominente coriaceis; *glomerulis* parvis solitariis globosis paucifloris pedunculis phyllodia circiter adæquantibus fultis; *calyce* obsoleto; *petalis* 4 liberis ovato-oblongis obtusis prominenter 1-nervibus.

Mt. Marshall; *Stoward*, 756.

Phyllodia 2–3 mm. long. incluso puncto pungenti fere 1 mm. long., 1–1·5 mm. lat., in sicco viridia. Pedunculi circa 2 mm. long. Glomeruli pansi 1·5 mm. diam. Petala 1·25 mm. long. Legumen haud visum.

The curious little phyllodes easily serve to distinguish this species, which seems to be near *A. erinacea*, Benth. and *A. Huegelii*, Benth.

A. idiomorpha, A. Cunn. Wongan Hills; *Stoward*, 198.

ACACIA (*Uninerves*) SAXATILIS, sp. nov. *Ramulis* angulatis leviter pruinosis cito glabris; *phyllodiis* oblongis apice rectis obtusissimisque ipso mucronatis basi obtusis stipitique brevi crasso insertis obscure 1-nervibus raro 2-nervibus crassiusculo-coriaceis leviter pruinosis; *glomerulis* globosis pedicellis solitariis quam folia brevioribus suffultis; *sepalis* liberis anguste spathulatis ciliolatis; *petalis* liberis sepala plane superantibus oblongo-spathulatis acutis.

Bruce Rock; *Stoward*, 708.

Phyllodia margine superiori obscure glandulosa, pleraque 1·5–2 cm. long., 3–4 mm. lat.; horum stipes transversim rugatus, 1 mm. long. Pedunculi 3–8 mm. long. Glomeruli 4 mm. diam. Sepala ·75 mm., petala 2 mm. long. Legumen ignotum.

To be inserted next *A. ligustrina*, Meissn., from which it can be told by the smaller and narrower fleshy and pruinose phyllodes not oblique at the apex. There are also differences in the shape and size of the petals as well as the ovary, thus indicating a difference in the fruit.

A. sericocarpa, W. V. Fitzg. Nungarin; *Stoward*, 281, 376.

A. Merrallii, F. Muell. Nungarin; *Stoward*, 480.

ACACIA (*Uninerves*) STOWARDII, sp. nov. Planta glabra; *ramis* angulatis paucistriatis; *phyllodiis* elongatis anguste-linearibus obtusis tetragonis ad angulos induratis facie utraque nervo tenui percursis mucronatis apice rectis vel leviter uncinatis; *floribus* 4-meris in racemos pedunculatos oligocephalos quam phyllodia multo breviores digestis; *glomerulis* globosis plurifloris pedunculis propriis sese adæquantibus insidentibus; *sepalis* alte connatis quam petala libera plane brevioribus; *petalis* spathulato-oblongis obtusis; *filamentis* basi connatis; *legumine* elongato lineari-toruloso leviter puberulo.

East of Katanning; *Stoward*, 177.

Phyllodia longit. nonnunquam 16 cm. attingentia, sæpius vero ± 12 cm., 1 mm. lat., in sicco griseo-viridia. Racemi plerique 1–2·5 cm. long.; pedunculus 2–10 mm. long.; pedunculi proprii circa 2 mm. long. Glomeruli 4 mm. diam. Calyx 1 mm., petala 1·6 mm. long. Legumen stipite 3 mm. long. insidens, 12 cm. long.

Near *A. dentifera*, Benth., but easily known by the narrower tetragonous phyllodes, the always racemose inflorescences, gamophyllous calyx, &c.

A. DENTIFERA, Benth., *var.* INTERMEDIA, var. nov. Phyllodia 3·5–5·5 cm. × 3–4 mm. Nungarin; *Stoward*, 302.—*Var.* PARVIFOLIA, var. nov. Phyllodia 3–5 cm. × 1–1·5 mm. Bruce Rock; *Stoward*, 333. Mt. Marshall; *Id.*, 451. No other divergence from type noticed.

A. aciphylla, Benth. Nungarin; *Stoward*, 388. Bruce Rock; *Id.*, 479.

A. stereophylla, Meissn. Kununoppin; *Stoward*, 447.

ACACIA (*Bipinnatæ*) GRISEA, sp. nov. *Ramulis* subteretibus striatis griseo-pubescentibus; *foliis* brevipetiolatis 2-jugis foliolorum paribus 4–8 foliolis parvis sessilibus ovato-oblongis utrinque obtusissimis subtus uninervibus firme membranaceis uti rhachis griseo-pubescentibus; *stipulis* minutis setaceis puberulis; *pedunculis* foliorum rhachin circiter æquantibus axillaribus solitariis glabris glomerulum globosum fulcientibus: *calyce* gamosepalo pubescente lobis abbreviatis rotundatis aliquanto incrassatis; *petalis* paullo ultra medium liberis parte libera oblongo-ovata obtuse acuta.

East of Katanning; *Stoward*, 166.

Folia in toto 1 cm. long., ultima paullo breviora; foliola 3 × 2 mm.; petiolus 1–3 mm. long.; rhachis plerumque circa 3 mm. long., apice incurvo-apiculata, haud indurata; glandulæ interjugales dum adsint minutæ. Stipulæ circa 1 mm. long. Pedunculus profecto evolutus 8–10 mm. long. Glomeruli 5 mm. diam. Calyx 1·2 mm., corolla 2 mm. long. Legumen mancum.

Judging from the figure in Engl. Bot. Jahrb. xxxv. (1904) p. 313, this is close to *A. Moirii*, E. Pritz., which is described as hirsute chiefly in its younger parts with sessile unijugate leaves, each juga having 4–5 leaflets nearly glabrous on their upper face and about 2 × 1 mm.; moreover, the rhachis of these leaves ends in a spine. There seems little difference in the flowers. The fruit of neither is known.

HALORRHAGACEÆ.

Halorrhagis Gossei, F. Muell. Mulline; *Maryon*. A fine specimen, more than 1 foot high, of this rare plant, which Schindler would merge in *H. tenuifolia*, Benth., but apparently without sufficient warrant.

MYRTACEÆ.

Chamælaucium brevifolium, Benth. Belka; *Stoward*, 351.

CALYTHRIX STOWARDII, sp. nov. Fruticosa, glabra; *ramis* sat gracilibus superne copiose foliosis inferne nudis; *foliis* confertis anguste linearibus

apice subpungentibus teretibus leviter crassiusculis; *floribus* in axillis superioribus solitariis subsessilibus; *bracteolis* quam calycis tubus multo brevioribus inter se liberis lanceolatis acuminatis; *calycis* tubo inferne anguste fusiformi superne cylindrico tenero solido faucibus leviter dilatatis lobis *e* basi parva suborbiculari in caudam filiformem tubum excedentem extenuatis; *petalis* ovatis obtusis calycis loborum basin dilatatam facile excedentibus; *disco* breviter cupulato; *staminibus* circa 40; *stylo* diutule persistente.

Wongan Hills; *Stoward*, 190.

Ramuli 1–1·5 mm. diam.; cortice cinereo rimoso filamentoso-exuviato circumdati. Folia ± 1 cm. long., ·3 mm. crass., in sicco viridia. Pedicelli 1·5 mm. long. Bracteolæ 3·5 mm. long. Flores purpurei. Calycis tubus (ovario haud exempto) 7 mm. long.; ovarium summum ·75 mm. lat.; loborum basis dilatata vix 1·5 mm. long. et lat.; caudæ 1 cm. long. Discus ·5 mm. diam. Filamenta nunc 5 mm. long. vel etiam longiora, nunc modo 2 mm.; antheræ ·3 mm. long. Stylus 4 mm. long.

Flowers much like those of *C. tenuiramea*, Turcz., but foliage altogether different.

C. brevifolia, Meissn. Wongan Hills; *Stoward*, 191.

Thryptomene tenella, Benth. Bruce Rock; *Stoward*, 322, 359, 426.

T. urceolaris, F. Muell. Nungarin; *Stoward*, 789.

T. tuberculata, E. Pritz. (ex descript.). Nungarin; *Stoward*, 301.

Micromyrtus Drummondii, Benth. Bruce Rock; *Stoward*, 321, 423, 444.

M. racemosa, Benth. Bruce Rock; *Stoward*, 445.

BAECKEA (§ *Rinzia*) CARNOSA, sp. nov. Verisimiliter suffrutex glaber copiose ramosus; *ramis* tenuibus nudis; *ramulis* gracillimis omnimodo foliosis; *foliis* minutis ramulo arcte applicatis ovatis obtusis dorso rotundatis carnosulis nitidis; *floribus* paucis axillaribus breviter pedicellatis pedicellis solitariis; *calycis* tubo campanulato quam lobi deltoidei obtusi longiore; *petalis* calycis lobos excedentibus suborbicularibus margine leviter undulatis; *staminibus* 10 filamentis præcipue eorum petalis oppositorum complanatis apice integris antheris ambitu suborbicularibus connectivo in glandulam globosam sessilem exeunte; *ovario* subglobulari basi solummodo adnato 3-loculari loculis pluriovulatis.

Bruce Rock; *Stoward*, 315.

Folia ·6–1 mm. long. Pedicelli 1·5 mm. long. Calycis tubus 1·5 mm., lobi ·75 mm. long. Petala 2 × 2·5 mm. Filamenta antipetala 1·5 mm., antisepala 1 mm. long., antheræ ·35 mm. diam. Ovarium 2 mm. diam. Stylus breviter immersus, fere 2 mm. long.

Known on sight from all species of § *Rinzia* by the minute fleshy leaves.

B. Elderiana, E. Pritz. Belka; *Stoward*, 304. Bruce Rock; *Id.*, 320.

B. crispiflora, F. Muell. Wongan Hills; *Stoward*, 193. Kauring; *G. W. Brown* (Hb. Stoward, 571).

BAECKEA (§ *Euryomyrtus*) CLAVIFOLIA, sp. nov. Glabra; *ramulis* tenuibus crebro foliosis; *foliis* in ramulis brevissimis sæpe subverticillatis parvis sessilibus cylindrico-claviformibus obtusis glandulis prominentibus tuberculatis; *floribus* solitariis subsessilibus; *bracteis* persistentibus ovatis apice rotundatis quam calycis tubus turbinatus prominenter glandulosus brevioribus; *calycis* lobis late ovatis obtusissimis tubum circa semiæquantibus sordide albis; *petalis* calycis lobos facile excedentibus suborbicularibus breviter unguiculatis; *staminibus* 10 quorum 5 petalorum medio oppositis filamentis leviter complanatis omnibus glabris antheris longitrorsum dehiscentibus glanduloso-appendiculatis; *ovario* omnino infero 3-loculo; *ovulis* quove in loculo 2 collateralibus.

Belka; *Stoward*, 305.

Folia pleraque 1·5–2 mm. long., circa ·6 mm. diam., in sicco læte viridia. Bracteæ exteriores 1·25 mm., interiores 1·5 mm. long., firme scariosæ. Calycis tubus 2 mm., lobi 1 mm. long. Petala 2 mm. diam. Filamenta antipetala 1 mm., antisepala ·5 mm. long. Stylus breviter immersus, 1 mm. long.

Near *B. crassifolia*, Lindl. and *B. Maideni*, Ewart & White, differing from both in the leaves and bracts among other featnres.

BAECKEA (§ *Euryomyrtus*) STOWARDII, sp. nov. Glabra; *ramulis* erectis crebro foliosis; *foliis* in ramulis brevissimis sæpe pseudoverticillatis alibi magis distantibus parvis sessilibus oblongis facie planis dorso rotundis necnon ob glandulas prominentes tuberculatis; *floribus* solitariis subsessilibus bracteis 4 persistentibus late ovatis calyce brevioribus stipatis; *calycis* tubo turbinato levi quam lobi ambitu fere semicirculares plane longiore; *petalis* breviter unguiculatis suborbicularibus margine crispulis; *staminibus* 16–18 quorum 5 petalorum medium opponentibus filamentis leviter complanatis antheris longitrorsum dehiscentibus glandula globulari onustis; *ovario* 3-loculo; *ovulis* in loculis 2 collateralibus.

Cowcowing; *Stoward*, 316.

Folia usque ad 4 mm. sæpe vero modo circa 2 mm. long., 1 mm. lat., in sicco griseolo-viridia. Bracteæ firme scariosæ, ægre 2 mm. long. Calycis tubus 2·5 mm. long.; lobi roseo-albi longit. 1 mm. paullulum excedentes Petala vix 3 mm. diam. Filamenta antipetala 1 mm., antisepala ·75 mm. long. Stylus brevissime immersus, vix 1 mm. diam.

This differs from the last described chiefly in the flattened leaves and the larger flowers with more numerous stamens.

Baeckea (§ *Oxymyrrhine*) exserta, sp. nov. Fruticulus parvulus crebro ramosus glaber; *ramulis* permultis attenuatis bene foliosis; *foliis* parvis sessilibus decussatis semiteretibus (facie aliquanto excavatis dorso rotundatis) apice obtusis; *pedicellis* solitariis folia plane excedentibus; *bracteolis* juxta medium pedunculum ovatis scariosis fugaceis; *calycis* tubo hemisphærico in sicco ruguloso quam lobi subreniformes rosei margine albi paullulum longiore; *petalis* orbicularibus calycis lobos facile excedentibus; *staminibus* circa 20 filamentis certe etsi breviter exsertis crassiusculis aliquanto complanatis sæpe basi raro hac atque illac altius connatis antheris 4-lobis longitudinaliter dehiscentibus; *ovario* semisupero 3-loculo loculis in placenta peltata pluriovulatis; *stylo* satis alte immerso filamentis fere æquialto.

Bruce Rock; *Stoward*, 427.

Folia 1·5–2 mm. long., circa ·5 mm. lat. Pedicelli 5 mm. long., horum bracteæ rubicundæ, vix 1 mm. long. Calycis tubus fere 2 mm. long.; lobi 1·5 mm. Petala 3·5 mm. diam. Filamenta 3 mm. long.; antheræ circa ·5 mm. diam. Stylus 2·5 mm. long.

The exserted stamens serve at once to distinguish this species, a character showing a tendency towards *Kunzea*.

Baeckea (§ *Oxymyrrhine*) tenuiramea, sp. nov. Glabra; *ramis* subteretibus cortice cinereo obductis ramulos breves plures crebro foliosos emittentibus; *foliis* ramuli partem superiorem omnino obtegentibus exiguis obovatis apice rotundatis dorso carinatis margine ciliolatis; *floribus* in axillis superioribus solitariis pedicellis quam folia plerumque longioribus fultis juxta basin bibracteolatis bracteolis oblongis obtusis concavis pedicello plane brevioribus; *calycis* tubo turbinato quam lobi rotundati margine scariosi longiore; *petalis* suborbicularibus; *staminibus* 10 nullis medio petalo oppositis filamentis filiformibus antheris globosis sulcatis; *ovario* 3-loculari loculis ∞-ovulatis.

Nungarin; *Stoward*, 407.

Ramuli rigidi. Folia pleraque 1–2 × 1 mm. Pedicelli 2–3 mm., ovarium 2 mm., calycis lobi 1 mm. long. Petala 3 × 3 mm. Filamenta ·75 mm. long.; antheræ ·5 mm. diam.

To be inserted between *B. pachyphylla*, Benth. and *B. crispiflora*, F. Muell., differing from both, *inter alia*, in the foliage and decandrous flowers.

B. corymbulosa, Benth. Kauring; *G. W. Brown* (Hb. Stoward, 652).

Baeckea (§ *Babingtonia*) thymoides, sp. nov. Glabra; *ramis* ramulisque subteretibus his saltem superne bene foliosis; *foliis* sessilibus decussatis ovatis vel oblongo-ovatis obtusis vel obtusissimis basi obtusis nisi rotundatis levissimeve cordatis planatis membranaceis glandulis fuscis satis perspicuis inspersis; *floribus* solitariis pedicellis supra medium bibracteolatis foliis circiter æquilongis insidentibus; *calycis* tubo campanulato 5-striato quam lobi late ovati obtusi longioribus; *petalis* calycis lobos plane superantibus orbicularibus margine undulatis; *staminibus* 15 quorum nullis petalorum medio oppositis filamentis omnino liberis aliquanto complanatis antheris subglobosis 2-porosis connectivo glanduloso; *ovario* ægre omnino infero 3-loculari; *ovulis* quove in loculo pluribus placentæ peltatæ affixis; *stylo* alte immerso.

Nungarin; *Stoward*, 346.

Folia 2·5–3 × 1·5 mm. Pedicelli filiformes 2–3 rarius usque ad 4 mm. long.; horum bracteolæ lineares, virides, circa 2 mm. long. Calycis tubus 1·5 mm., lobi ·75 mm. long. Petala 3 mm. diam. Filamenta 1–1·5 mm. long.; antheræ ·3 mm. crass. Stylus fere 1·5 mm. long.

Apparently nearest *B. pentagonantha*, F. Muell., differing chiefly in the flat membranous leaves, smaller flowers, eglandular connective and 3-celled ovary.

Baeckea (§ *Babingtonia*) imbricata, sp. nov. Glabra; *ramulis* subteretibus vetustioribus paucifoliatis vel nudis junioribus foliis imbricatis omnino occlusis; *foliis* exiguis sessilibus decussatis ovatis apice mucronulatis facie concavis dorso perspicue carinatis glandulis paucis immersis præditis crassiusculis; *floribus* solitariis pedicellis folia æquantibus basi bracteolatis suffultis; *bracteolis* pedicellis circiter æquilongis foliis subsimilibus; *calycis* tubo campanulato sublevi lobis semiorbicularibus longiori; *petalis* suborbicularibus leviter crispulis; *staminibus* circa 15 quorum nullis medio petalorum oppositis filamentis aliquanto complanatis antheris subglobosis 2-porosis connectivo eglanduloso; *ovario* fere omnino infero 3-loculo loculis pluriovulatis; *stylo* alte immerso.

Kununoppin; *Stoward*, 398.

Folia 1–1·5 mm. long., circiter totidem lat. Pedicelli vix usque 2 mm. long., sæpe vero breviores. Calyx totus vix 2·5 mm. long.; lobi ægre 1 mm. Petala fere 3 mm. diam. Filamenta longiora ·75 mm. breviora ·25 mm. long.; antheræ ·3 mm. diam. Stylus ·75 mm. long.

Easily distinguished among its congeners of § *Babingtonia* by the foliage and the bracts.

Melaleuca (*Pauciflorœ*) concava, sp. nov. Fruticosa, crebro ramosa, glabra; *ramulis* attenuatis foliis imbricatis obtectis; *foliis* subsessilibus oblongo-subulatis superne recurvo-patentibus apice pungentibus rigidis facie concavis dorso rotundis; *floribus* in capitula parva ex ramis jam defoliatis oriunda (anne semper?) digestis; *calycis* tubo campanulato quam lobi triangulares certe longiore; *petalis* ovatis obtusissimis calyci fere æquilongis; *staminum* phalangibus circiter 15-andris ungue petala breviter excedente filamentis quam unguis brevioribus; *disco* sericeo; *ovulis* quove in loculo pluribus placentæ peltatæ affixis; *capsula* subglobulari ore nuda.

Cowcowing; *Stoward*, 492. Nungarin; *Id.*, 804.

Folia solemniter 6–10 mm. long., 1 mm. lat. vel paullulum ultra ; petioli 1 mm. long., decolores. Calycis tubus 2 mm., lobi ægre 1 mm. long. Petala vix 2 mm. long. Staminum unguis 2·25 mm. long.; filamenta 1 mm. long. Stylus crassiusculus, fere 4 mm. long. Capsula 3 mm. long., ore 2·25 mm. diam.

To be inserted next the Eastern *M. pustulata,* Hook., from which the foliage affords an easy means of separation.

UMBELLIFERÆ.

SIEBERA OBLONGA, sp. nov. Fruticosa, ramosa; *ramis* foliosis microscopice griseo-puberulis ; *foliis* satis approximatis sessilibus linearibus apice mucronulatis basi obtusis; *umbellis* compositis brevibus ex umbellulis 3–7 constantibus; *pedunculis* sub flore quam folia brevioribus; *involucri* phyllis circa 3 foliis similibus sed multo minoribus; *calycis* dentibus triangularibus acutis; *fructibus* late oblongis utrinque obtusissimis carpellis compressis dorso acutis jugo dorsali parum prominulo juga lateralia subevanida commissura plana.

Katanning; *Stoward*, 167.

Folia plerumque 1·5–2 cm. long., 1 mm. lat., facie concava, dorso rotundulata, obscure costata, in sicco fuscescentia. Umbellæ floriferæ 2·5 × 2·5 cm.; harum pedunculus sub flore 5 mm. sub fructu usque 2 cm. long. ; pedunculi proprii sub flore 5–6 mm. long. Involucri phylla 1–1·5 mm. long., involucelli etiam minus. Pedicelli ·2 mm. long. Fructus 2 × 1·5 mm.

Differs from *S. commutata*, Benth. in the larger leaves and the oblong (not orbicular) fruits.

COMPOSITÆ.

OLEARIA (§ *Eriotriche*) PROPINQUA, sp. nov. Verisimiliter frutex copiose ramosus; *ramulis* sat tenuibus bene foliosis cinereo-tomentosis; *foliis* alternis sessilibus nisi subsessilibus oblongis vel anguste oblongo-obovatis obtusis margine planis necnon minutissime denticulatis supra viridibus cito glabris subtus cinereo-tomentosis; *capitulis* mediocribus pluriflosculosis ramulos solitatim terminantibus breviter pedunculatis; *involucri* subhemisphærici 4-serialis phyllis lanceolatis acutis intus gradatim longioribus exterioribus intermediisque tomentosis intimis margine exempto glabris; *ligulis* circa 14 oblongis optime exsertis; *corollis* disci deorsum coarctatis; *antheris* basi obtusiusculis; *styli* ramis appendicibus lanceolatis præditis; *achæniis* aliquanto compressis sericeo-villosulis; *pappi* setis scabriusculis sordide albis.

Cowcowing; *Stoward*, 460 (also at Kew from the same place; *Max Koch*, 1088).

Ramorum folia usque ad 15 vel etiam fere 20 mm. long., 3·5–5 mm. lat.;

ramulorum ±6×1·5 mm.; petioli dum adsint 1 mm. long. vel paullulum ultra. Capitula 8–10×10–12 mm.; horum penduneulus cinereo-tomentosus, 12 mm. long. nisi minus. Involucri phylla extima circa 3 mm., intermedia 4–5 mm., intima 6 mm. long. Ligulæ apice microscopice 3-denticulatæ, 10 mm. long. Corollæ disci 6 mm. long.; tubus inferne ·25 mm. lat., gradatim adusque 1 mm. dilatatus. Styli rami exserti, appendicibus ægre 1 mm. long. inclusis 2 mm. long. Achænia adhuc cruda ·75 mm. long. Pappi setæ 4–5 mm. long.

Affinity close with *O. pimeleoides*, Benth., of which it is probably the Western representative. From this it is known by its somewhat larger leaves, narrower and acute involucral leaves, corolla markedly narrowed below, and style-arms with quite different appendages.

HELIPTERUM (§ *Euhelipterum*) VENUSTUM, sp. nov. Herba annua, spithamea, a basi pauciramosa sparsim pilosa; *ramis* erectis aliquantulum anfractuosis tenuibus subdistanter foliosis; *foliis* sessilibus angustissime linearibus obtusis; *capitulis* majusculis multiflosculosis homogamis solitariis terminalibus pedunculis sat longis squamis parvis hac atque illac præditis insidentibus; *involucri* subhemisphærici phyllis exterioribus ovatis apice rotundatis scariosis nitentibus dilute brunneis interioribus lamina longa radiante anguste oblongo-ovata obtusa vivide flava onustis; *corollæ* tubo a basi gradatim leviterque amplificato; *antheris* subinclusis loculis breviter caudatis; *achæniis* maxime complanatis obovato-subquadratis glabris; *pappi* setis circiter 10 a basi præcipue vero apicem versus plumosis dilute flavis.

Mt. Magnet district, Youanne; *Maryon*.

Folia pleraque 1·5–2·5 cm. long., modo ·25–·5 mm. lat. Pedunculi longit. 8 cm. attingentes sed sæpe breviores; horum squamæ ovatæ, tenuiter scariosæ, 1–2 mm. long. Capitula pansa circa 3 cm. diam. Involucri phylla exteriora intus gradatim longiora, 2–5 mm. long.; intima late ovata, hyalina, costa lata percursa, 2·5 mm. long., horum appendix radians 1·5 cm. long. Receptaculum convexum. Corolla 4 mm. long.; antheræ 1·25 mm. Styli rami aliquanto complanati, apice truncato-capitati, 1 mm. long. Achænia perlucida, vix matura fere 1·5 mm. long., 1 mm. lat. Pappus 2·5 mm. long.

To be inserted in the genus next *H. hyalospermum*, F. Muell.: the long radiating lamina to the inner leaves of the involucre and the very flat glabrous achenes are its chief peculiarities.

Helipterum Battii, F. Muell. Mt. Magnet district, Youanne; *Maryon*. Excellent material of this exceedingly rare plant.

H. Charsleyæ, F. Muell. Menzies; *Stoward*, 142.

HELIPTERUM (§ *Pteropogon*) MULLINENSE, sp. nov. Herba spithamea vel minus, a basi ramosa; *ramis* ascendentibus crebro foliosis laxe araneosis deinde piloso-puberulis; *foliis* alternis (paucis vetustioribus suboppositis) sessilibus oblongis mucronatis leviter laxeque araneosis; *capitulis* parvis circa 10-flosculosis in glomerulos terminales globosos polycephalos araneosos dispositis; *involucri* cylindrico-turbinati 5-serialis phyllis oblongis vel anguste oblongo-obovatis tenuiter hyalinis linea centrali viridi-fusca percursis appendice radiante parva ovata vel ovato-oblonga obtusa rotundatave læte flava onustis; *flosculis* inclusis pluribus sterilibus; *corolla* anguste infundibulari 5-loba; *antheris* tenuiter caudatis; *achæniis* cylindricis papillosis; *pappi* setis circa 14 corollis subæquilongis mediocriter plumosis sordide albis.

Mulline; *Maryon.*

Folia sæpissime 1·5–2·5 cm. long., 1·5–3 mm. lat. Capitulorum glomeruli circa 1·5 mm. diam. Pedunculi proprii summum 1 mm. long. Capitula pansa 5 × 2·5 mm. Involucri phylla 4–4·5 mm. long. (appendice 1–1·5 mm. haud exempta). Corolla 4 mm. long. Achænia adhuc cruda ·75 mm., pappus 3·75 mm. long.

On first sight this might be supposed an early state of *H. Haighii*, F. Muell., but examination of the capitula would immediately show the mistake.

HELIPTERUM (§ *Pteropogon*) INTERMEDIUM, sp. nov. Planta tenera circiter semispithamea sæpe a basi ramosa glabra; *ramis* gracilibus superne ramulosis distanter foliosis; *foliis* inf. oppositis sup. sparsis sessilibus anguste linearibus obtusis; *capitulis* parvis homogamis raro heterogamis 3–10-flosculosis ad apicem ramulorum corymbum laxum oligocephalum efficientibus; *involucri* turbinati phyllis 4-serialibus exterioribus intermediisque ovatis illis appendice anguste lineari viridi onustis his inappendiculatis apice acutis phyllis intimis lanceolatis uti cetera hyalinis appendice brevi triangulari obtusa flava radiante præditis; *flosculis* casu sterilibus inclusis; *corolla* anguste infundibulari 5-loba; *antheris* basi tenuiter caudatis; *achæniis* aliquanto compressis anguste oblongo-ovoideis dense villosis; *pappi* setis 15–20 corollam excedentibus perspicue plumosis dilute flavis.

Kauring; *Stoward*, 593.

Folia adusque 2 cm. long. vel etiam longiora, plerumque vero ±1 cm. long., ·2–·5 mm. lat. Pedunculi proprii ±3 mm. long. Capitula pansa 7·5–8 × 3·5–4 mm. Involucri phylla exteriora circa 5 mm. long. (appendice lineari 2 mm. long. inclusa); intermedia 5–6 mm. long.; intima in toto 6·5 mm., harum appendix 1·5 mm. long. Corolla 3 mm. long. Achænia breviter stipitata, fere 2 mm. long.; pappus 3·5 mm. long.

Intermediate between *H. tenellum*, Turcz. and *H. gracile*, Benth., with the short radiating lamina to the inner involucral leaves of the latter and the former's turbinate (not ovoid) involucre. From both it differs in the smaller heads with fewer florets.

H. oppositifolium, S. Moore. Mulline; *Maryon.*

H. craspedioides, W. V. Fitzg. Mulline; *Maryon.* The specimens agree well with the description of this appropriately named species.

HELIPTERUM (§ *Monencyanthes*) MARYONII, sp. nov. Planta vix spithamea; *caule* subsimplici tenui subdistanter folioso sparsissime araneoso mox glabro; *foliis* sessilibus anguste lineari-lanceolatis obtusiusculis basi breviter decurrentibus scabriusculis leviter araneosis; *capitulis* parvis circa 12-flosculosis homogamis in cymas oligocephalas sublaxas ramulos terminantes dispositis; *involucri* campanulato-turbinati 4-serialis phyllis exterioribus ovatis glabris vel fere glabris interioribus lanceolatis obtusis dorso lana alba elongata onustis omnibus lamina tenuiter scariosa dilutissime brunnea præditis; *flosculis* exertis; *corollæ* tubo cylindrico (superne levissime ampliato) limbum 5-lobum duplo superante; *antherarum* loculis basi breviter caudatis; *achæniis* oblongis superne sparsim piliferis; *pappi* setis circa 8 achænio paullo longioribus albis.

Mulline; *Maryon.*

Folia pleraque 1–2 cm. long., 2–3 mm. lat. Cymæ 3–7-cephalæ, summum 1 cm. long. et lat. Pedunculi proprii filiformes, araneosi, 2–3 mm. long. Capitula pansa 6 × 3 mm. Involucri phylla 3–4 mm. long. Corollæ flavæ tubus 1·75 mm. long.; lobi anguste ovato-oblongi, obtusi, vix 1 mm. long. Achænia adhuc cruda 2 mm. long., pappus 2·25 mm.

Near *H. Tietkensii*, F. Muell., differing chiefly in the slenderer habit, open few-headed cymes, somewhat larger and broader capitula, longer achenes, and smaller number of hairs to the pappus.

CALOCEPHALUS STOWARDII, sp. nov. Humilis, annuus, caules plures a basi emittens; *caulibus* gracilibus ut folia alterna sessilia linearia apice mucronulata laxe araneoso-tomentosis; *capitulorum* glomerulis terminalibus sessilibus subglobosis polycephalis; *pedunculis propriis* abbreviatis; *capitulis* 3-flosculosis; *involucri* ovoideo-oblongi phyllis 8 inter se subsimilibus ovato-oblongis obtusis tenuiter hyalinis dilute citrinis exterioribus dorso longe lanuginosis interioribus glabris; *corollis* flavis; *achæniis* obovoideis compressis papillosis; *pappo* e setis paucis plumosis basi intricatis sistente.

Cowcowing; *Stoward*, 485.

Planta 5–8 cm. alt. Folia pleraque 6–8 mm. long., ·75 mm. lat. Glomeruli 6–8 × 7–9 mm. Pedunculi proprii teneri, circa 1 mm. long. Involucri phylla 2·5–2·75 mm. long. Corolla 2 mm. long. Antherarum loculi breviter caudati. Achænia cruda ·75 mm. long., pappus circa 2 mm.

The affinity of this would seem to be with *C. Drummondii*, Benth. and *C. phlegmatocarpus*, Diels. The chief points are the small alternate leaves, the very pale yellow involucral leaves all subsimilar of which the outer ones alone are woolly on the back, the head always with 3 florets, and the yellow corolla like the pappus short.

C. Skeatsianus, Ewart & White. Dowerin-Merriden district; *Stoward*, 82.

STYLIDIACEÆ.

STYLIDIUM (*Tolypangium* § *Squamosæ*) NUNGARINENSE, sp. nov. Herba perennis spithamea vel paullulum ultra; *foliis* radicalibus elongatis anguste lineari-oblongis inferne in petiolum longum extenuatis coriaceis glabris squamis parvis ovatis apiculatis scariosis intermixtis; *scapo* foliis circiter æquilongo tereti glanduloso-pubescente; *floribus* in paniculam racemiformem abbreviatam paucifloram digestis; *bracteis* oblongis lanceolatisve acutis vel obtusis; *pedicellis* floribus brevioribus uti bracteæ et calyx et corolla glanduloso-pubescentibus; *calycis* lobis late oblongis obtusissimis tubo brevioribus; *corollæ* tubo calycis lobis breviore lobis obovato-panduriformibus apice rotundatis posticis quam laterales plane brevioribus labello ovato obtuso lobis accessoriis posticis ambitu ovatis medium usque bifidis segmentis lanceolatis lobis accessoriis lateralibus rotundatis additis lobis 2 brevibus lineari-oblongis labello affixis; *columna* corolla longiore; *ovario* anguste oblongo-ovoideo.

Nungarin; *Stoward*, 785.

Folia (petiolo incluso) usque circa 26 cm. long., sursum 4–4·5 mm. lat.; costa media valida, utrobique perspicua. Squamæ circiter 1 cm. long., dilute albo-roseæ. Scapus ±25 cm. long. Bracteæ 4 mm. long. Pedicelli ±7 mm. long. Flores vix 15 mm. long. Calyx totus 7·5 mm. long.; lobi soli 3 mm. Corollæ tubus 1·5 mm. long.; lobi postici 4 mm., laterales 6 mm., labellum 1·5 mm. long., hujus lobi accessorii 1 mm. long.; lobi accessorii postici 1·25 mm. long., laterales 2·5 × 2 mm. Columna vix 10 mm. long.

To be inserted next *S. affine*, Sond., which has larger flowers with lanceolate sepals, a longer tube to the corolla, differently shaped corolla-lobes both primary and accessory, and the column shorter than the corolla.

STYLIDIUM (*Nitrangium* § *Thyrsiforme*) GLANDULIFERUM, sp. nov. Herba semispithamea; *foliis* radicalibus linearibus inferne petioliformi-angustatis margine cartilagineo minute ciliolato-serrulatis glabris squamis parvis ovatis apiculatis scariosis intermixtis; *scapo* folia excedente glanduloso-hirsutulo; *racemis* subdistanter plurifloris; *bracteis* linearibus pedicellis brevioribus ut pedicelli calycesque glanduloso-hirsutulis; *calycis* tubo oblongo-ovoideo lobos oblongos obtusos excedente; *corollæ* tubo calycis lobos æquante lobis æquimagnis ovatis obtusis lobis accessoriis 2 oblongo-ovatis obtusissimis glandulis stipitatis maxime prominentibus præditis labello lineari-lanceolato appendicibus brevibus filiformibus instructo; *columna* longe exserta; *ovario* 2-loculo ovulis pluribus 1-serialibus; *capsula* verisimiliter ovoidea.

Kununoppin; *Stoward*, 481.

Folia 6–8 cm. long., 1·5–2 mm. lat. Scapus evolutus saltem 13 cm. attingens. Pedicelli filiformes, vetustiores tandem 8–15 mm. long. Bracteæ 3–4 mm. long. Flores 13 mm. long. Calyx totus 5 mm., lobi 1·5 mm. long. Corollæ tubus 1·5 mm. long.; lobi ægre 3 mm. long., lobi accessorii longit. 1 mm. paullulum excedentes; labellum 1 mm. long., appendicibus ·5 mm. long. onustum. Columna 6 mm. long.

Known from all the species of *Nitrangium* by the prominently glandular accessory lobes of the corolla.

GOODENIACEÆ.

SYMPHYOBASIS ALSINOIDES, sp. nov. (Pl. **12.** A.) Herba annua, exigua, vix semispithamea a basi graciliter ramosa, glanduloso-puberula; *foliis* lineari-oblongis vel anguste lanceolato- vel oblanceolato-linearibus obtusis costa media utrobique sat perspicua percursis; *floribus* parvulis in axillis solitariis pedicellis filiformibus foliis sæpius brevioribus fultis; *calycis* segmentis basin usque liberis lineari-lanceolatis acutis; *corolla* calycem paullo superante tubo urceolari ovario adnato antice in calcar breve tumidulum tubo concretum producto limbi lobis inter se similibus vix usque ad ovarium liberis oblongo-lanceolatis obtusis anguste alatis extus crebro glandulosis; *filamentis* filiformibus quam antheræ oblongæ apice mucronulatæ brevioribus; *stylo* erecto crassiusculo staminibus æquilongo.

Mulline; *Maryon*.

Folia longit. summum 2 cm. vel paullulum ultra, juniora 1–1·5 cm., hæc 1–1·5 mm. lat., cetera præsertim pauca radicalia 2–4 mm. Pedicelli 1 cm. long., patentes. Calycis segmenta 3 mm. long. Corolla tota 4 mm. long., hujus pars ovario adnata 1·25 × 1·25 mm.; calcar fere 1 mm. long.; lobi 2·5 mm. long.; horum alæ circa ·75 mm. long., 1 mm. lat., margine apicali truncatæ alibi undulatæ. Filamenta ·5 mm., antheræ ·75 mm. long. Stylus 1 mm. long.; indusium ·5 mm. diam.

K. Krause proposed, and no doubt properly, this genus for the reception of Mueller's curious *Velleia macroplectra*, the adhesion to the ovary all its way up of the corolla being the chief distinction of the new genus. In addition the flowers of *V. macroplectra* are provided with a long spur, an organ also found in the case of *S. alsinoides*, but greatly reduced in size and united with the tube of the corolla throughout its course. This feature and

the very small flowers of *S. alsinoides* serve at once to separate the two species. In general appearance the plant is remarkably like *Evolvulus alsinoides*, L.

This genus yields an excellent illustration of a very rare occurrence, viz. where the calyx is entirely free from the ovary while the corolla is adnate to it all the way up.

Velleia discophora, F. Muell. Kanunoppin; *Stoward*, 726.

V. rosea, S. Moore. Mulline; *Maryon*. Excellent material of this rare and beautiful plant. The specimens range by gradation from one very similar to the type up to others reaching 20 cm. in height and with the characters of K. Krause's var. *erecta*, which is therefore not worthy of separation as a variety.

CALOGYNE LINEARIS, sp. nov. Herba parvula, erecta; *caule* simplici parum ramoso gracili glanduloso-piloso-pubescente; *foliis* radicalibus oblongis vel oblongo-obovatis obtusis basin versus in petiolum attenuatis caulinis linearibus vel lineari-spathulatis omnibus glanduloso-pilosis; *floribus* parvis flavis pedunculis gracilibus folia sæpe excedentibus insidentibus; *calycis* lobis anguste lineari-laceolatis tubo æquilongis pilosulis; *corollæ* tubo brevi lato lobis anticis alis oblongis acutis præditis lobis posticis uno latere quam antici multo longius alatis; *filamentis* complanatis glabris antheris ovoideis apice minute mucronulatis; *stylo* biramoso; *capsula* compressa anguste ovoidea pilosula; *seminibus* ala angusta orbiculari cinctis.

Kauring; *G. W. Brown* (Hb. Stoward, 136, 795). Kanunoppin; *Stoward*, 307.

Planta sæpe ± 5 cm. alt., rarius 8–9 cm. attingens. Folia radicalia 5–15 mm. long., caulina 7–20 mm., hæc ·5–3 mm. lat. Pedunculi usque ad 4 cm. long., plerique vero multo breviores. Calycis tubus 2 mm., lobi 2 mm. long. Corolla 7·5 mm. long.; hujus tubus 1 × 1·5 mm. Filamenta 2 mm. long.; antheræ ·65 mm. Stylus pilosulus, 1 mm. long.; rami (indusio incluso) 3 mm. Capsula 7 mm. long. Semina 3 mm. diam.

Separable on sight from *C. Berardiana,* F. Muell., by the lowly habit and very small flowers.

Scævola restiacea, Benth. Mt. Marshall; *Stoward*, 374. Bruce Rock; *Id.*, 422.

Verrauxia villosa, E. Pritz. Kunuroppin; *Stoward*, 728.

Dampiera sacculata, F. Muell. Bruce Rock; *Stoward*, 424. Kauring; *G. W. Brown* (Hb. Stoward, 736).

D. juncea, Benth. Kauring; *G. W. Brown* (Hb. Stoward, 700, 734).

DAMPIERA (§ *Eudampiera*) RUPICOLA, sp. nov. *Ramulis* tenuibus subteretibus striatis glabris; *floribus* parvis sessilibus lineari-oblongis mucronulatis membranaceis nequaquam rigidis utrinque glabris; *floribus* parvis sessilibus vel subsessilibus ex axillis plerumque ramulorum ultimorum abbreviatorum solitatim oriundis; *calycis* tubo pilis simplicibus appressis sericeo lobis abbreviatis deltoideis obtusis; *corollæ* extus appresse sericeæ lobis anticis alis late oblongis margine undulatis præditis; *filamentis* lineari-oblongis apice truncatis antheras oblongas obtusas adæquantibus; *stylo* staminibus dimidio longiore; *ovulo* a basi erecto lineari.

Bruce Rock; *Stoward*, 720.

Innovationes appresse sericeæ. Folia (inferiora non suppetunt) circa 7–10 mm. long., fere usque 2 mm. lat. Bracteæ foliaceæ. Pedicelli summum 1 mm. long. Calycis tubus 2 mm., lobi ·75 mm. long. Corolla 8 mm. long.; loborum alæ anticorum 4·5 × 1·5 mm. Filamenta 1 mm., antheræ 1 mm. long. Stylus crassiusculus 3 mm. long.; indusium ·3 mm. diam.

Apparently nearest *D. leptoclada*, Benth., but with its slender habit, small thin leaves, and small flowers easily distinguished from it.

DAMPIERA (§ *Eudampiera*) STOWARDII, sp. nov. Suffrutex erectus circiter spithameus; *ramis* superne ramulosis ut ramuli tenuibus angulatis minutissime sericeis; *foliis* sessilibus oblongo-obovatis vel oblanceolato-oblongis summis equidem lineari-lanceolatis utrinque obtusis margine levissime revolutis coriaceis rigidis utrinque sed præsertim pag. inf. minutissime sericeis; *pedunculis* axillaribus 1–2-floris quam folia plerumque brevioribus uti pedicelli alabastraque tomento arcto stellato fusco-griseo indutis; *bracteis* minutis ovatis tomentosis; *calycis* tubo cylindrico lobis evanidis; *corollæ* lobis anticis alis oblongo-obovatis margine undulatis se ipsos bene superantibus onustis; *filamentis* linearibus antheris oblongis obtusis æquilongis; *stylo* quam stamina vix dimidio longiore.

Locality uncertain, most probably Belka; *Stoward*, 306.

Folia in sicco læte viridia, pleraque 2·5–4·5 cm. × 7–17 mm., juniora (ramulorum florentium) ± 15 × 4 mm. Pedicelli ± 7 mm. long. Bracteæ modo 1 mm. long. Calycis tubus 3·5 mm. long. Corolla 12 mm. long.; loborum anticorum alæ 7 mm. long. Filamenta 1·25 mm., stylus 3·5 mm. long.

D. glabrescens, Benth. comes nearest to this, but the new species has, *inter alia*, broader leaves and much smaller and quite differently shaped bracts. The foliage is more like that of the Eastern *D. adpressa*, A. Cunn.

EPACRIDACEÆ.

STYPHELIA TENUIFLORA, Lindl., *var.* BREVIFLORA, var. nov. *Folia* lineari-lanceolata, 10–15 × 2–3 mm. *Corolla* modo 10 mm. long. Darlington; *Stoward*, 241.

LEUCOPOGON (§ *Pleuranthus*) PUBESCENS, sp. nov. Frutex ramosus; *ramulis* ultimis uti foliorum pag. inf., bracteæ necnon bracteolæ griseo-pubescentibus; *foliis* parvis sessilibus ovatis vel oblongo-ovatis apice debiliter pungentibus planis patentibus coriaceis supra mox glabrescentibus nitidisque maxime inconspicue costatis subtus costis pluribus parallelis percursis; *floribus* in axillis superioribus solitariis vel binis pedunculo foliis multo breviore insidentibus; *bracteis* ovatis acutis quam bracteolæ suborbiculares subito mucronatæ plane brevioribus; *sepalis* bracteolas duplo excedentibus oblongo-lanceolatis breviter acuminatis extus pilosis; *corollæ* extus glabræ tubo calyce breviori faucibus villoso lobis revolutis lanceolatis acuminatis tubum æquantibus; *antheris* supra medium filamento conjunctis oblongis emarginatis loculis omnimodo fertilibus; *disci* glandulis ovato-oblongis obtusis ovarium sericeum 5-loculare æquantibus vel paullulum superantibus; *stylo* exserto.

Ongerup; *Stoward*, 850.

Folia 4–5×1·5–2 mm., in sicco griseo-viridia. Pedunculi crassi, circa 1 mm. long. Bracteæ ·75 mm., bracteolæ fere 2 mm. long. Calyx 3·5 mm. long. Corollæ tubus 2 mm. long.; lobi recurvi totidem. Antheræ 1·5 mm. long. Disci glandulæ ·6–·75 mm., ovarium ·6 mm., stylus 3·75 mm. long.

The foliage and indumentum are among the crucial features of this species, which appears to come nearest *L. cordifolius*, Lindl. In appearance it is much like *L. ovalifolius*, Sond., which has, however, flowers entirely dissimilar.

L. planifolius, Sond. Katanning; *Stoward*, 169.

One cannot but regret to see modern authors following Mueller's lead and sinking *Leucopogon* and several other genera in *Styphelia*. The separation into genera, originally proposed by Robert Brown, was approved among others by such competent authorities as De Candolle, Endlicher, Meisner, Lindley, and even Baillon. Moreover, after Mueller's rebellious action Bentham re-examined the question, who, while admitting Mueller's contention, denied by no one, as to the existence of intermediate species, objects to Mueller's comparison of *Styphelia* so enlarged with *Acacia* and other genera of many species which remain entire by general agreement, very properly observing that whereas *Acacia* and *Eugenia* for instance show the greatest uniformity in floral structure, that cannot be maintained of *Styphelia* in the Mueller sense. Authors who attach such importance to connecting links forget that generic demarcation is no more Nature's object than is specific; they also fail to realise how many amalgamations would have to be made upon the Muellerian principle if consistently carried out, together with the confusion in nomenclature resulting therefrom.

LOGANIACEÆ.

Logania flaviflora, F. Muell. Kauring; *G. W. Brown* (Hb. Stoward, 620).

BORAGINACEÆ.

Halgania viscosa, S. Moore. Bruce Rock; *Stoward*, 717.

SOLANACEÆ.

Solanum nummularium, S. Moore. Mulline; *Maryon.*

S. Oldfieldii, F. Muell. Kerrenketten; *Stoward*, 22. Dowerin-Merriden district; *Id.*, 74. Mt. Marshall; *Id.*, 385.

MYOPORACEÆ.

Pholidia Woolsiana, F. Muell., var. *dentata*, Ewart & White. Dowerin-Merriden district; *Stoward*, 68.

EREMOPHILA MACULATA, F. Muell., *var.* LINEARIFOLIA, var. nov. *Folia* abbreviata, anguste linearia, ± 1 cm. long. *Pedicelli* curvati, foliis circiter æquilongi. *Calyx* 4 mm., corolla 17 mm. long. Nungarin; *Stoward*, 347. Cowcowing; *Id.*, 494.

A somewhat remarkable variety of this variable species: it is perhaps entitled to specific rank.

E. Oldfieldii, F. Muell., var. *angustifolia*, S. Moore. Mulline; *Maryon.*

E. subfloccosa, F. Muell. Nungarin; *Stoward*, 348.

E. DRUMMONDII, F. Muell., *var.* BREVIS, var. nov. *Folia* quam ea typi breviora, sc. 5–15 mm. raro adusque 20 mm. long. *Pedicelli* multo breviores (vix usque 5 mm. long.). *Corolla* modo 14 mm. long. Kununoppin; *Stoward*, 393. Cowcowing; *Id.*, 461.

Possibly a distinct species, but the points of agreement seem to override the differences.

VERBENACEÆ.

Dicrastyles fulva, Drumm. Yandanooka; *Stoward*, 128.

D. parvifolia, F. Muell. Mt. Marshall; *Stoward*, 375.

Pityrodia cærulea, Ewart. Mt. Marshall; *Stoward*, 373. Cowcowing; *Id.*, 401, 458.

P. racemosa, Benth. Kununoppin; *Stoward*, 392.

P. lepidota, E. Pritz. Nungarin; *Stoward*, 283. Cowcowing; *Id.*, 317. Trayning; *Id.*, 442.

Cyanostegia angustifolia, Turcz. Dowerin-Merriden district; *Stoward*. Bruce Rock; *Id.*, 323, 435, 718. Trayning; *Id.*, 328, 443.

LABIATÆ.

HEMIGENIA (§ *Diplanthera*) VISCIDA, sp. nov. Suffrutex circa spithameus secrementum copiosum viscidum proferens; *caule* nudo superne 2-ramoso (anne semper?) ramis indivisis foliosis; *foliis* oppositis sessilibus ovatis obtusis basi cuneatim angustatis coriaceo-membranaceis pagina utravis glandulis immersis copiosissime obsitis; *floribus* in axillis solitariis subsessilibus; *bracteolis* calycem fere adæquantibus lanceolatis breviter acuminatis; *calycis* usque medium divisi tubo anguste campanulato 10-costato lobis inter se subæqualibus lanceolatis acuminatis margine ciliolatis; *corollæ* tubo calyce paullulum breviore infundibulari labio postico 2-lobo labii antici lobis quam postici brevioribus inter se subæqualibus late ovatis obtusissimis; *antherarum* connectivo lato satis elongato staminum posticorum apice truncato breviterque barbellato staminum anticorum loculo parvulo effeto glabro prædito.

Meenar; *Stoward*, 815.

Folia 15–19 × 9–10 mm. long. Pedicelli 1 mm. long. Bracteolæ sparsim piloso-ciliatæ, 10 mm. long. Calyx 13 mm. long., lobi soli 6·5 mm. Corollæ tubus 11·5 mm. long.; hujus lobi postici obovati, 6·5 mm. long.; lobi antici 5 mm. long. Antheræ 1·25 mm. long.; connectivus (loculo effeto incluso) 2 mm. Stylus ægre 12 mm. long.

The flower examined was somewhat injured, and there being but one other which must be preserved upon the specimen, the description of the limb of the corolla may err in some respects and should be regarded as provisional merely.

CHENOPODIACEÆ.

Chenopodium cristatum, F. Muell. Mulline; *Maryon*.

KOCHIA STOWARDII, sp. nov. *Ramis ramulis*que tomento subtili albo circumdatis his crebro foliosis; *foliis* sessilibus linearibus obtusis crassiusculis puberulis; *floribus* in axillis superioribus solitariis; *perianthio* fructescente fere glabro apice subplano tubo turbinato superne prominenter plurisulcato lobis late triangularibus margine sericeis ala horizontali vix omnino continuo margine undulato subtiliter multinervoso alis accessoriis nullis.

Nungarin; *Stoward*, 793.

Folia 6–8 mm. long., humectata lat. 1 mm. paullulum excedentia, in sicco fusco-grisea. Perianthii fructescentis tubus 4 mm. long., paullo supra basin 2·5 mm. apice 5 mm. lat.; hujus os 10 mm. diam.; ala sola 3 mm. lat.

In habit and foliage very like *K. spongiosa*, F. Muell., but the description of the fruit (there is no fruiting specimen in our herbaria) does not agree. The turbinate perianth-tube coupled with the absence of accessory wings form the chief characteristic of the species.

Anisacantha hispida, sp. nov. Suffrutex humilis intricate ramosus; *ramis* foliosis cito glabris tandem cicatricibus foliorum delapsorum prominentibus onustis; *foliis* parvis linearibus obtusis dorso rotundatis crassiusculis pilis griseis hispido-villosis diu persistentibus præditis; *perianthio* urceolato spinis 4 inæqualibus munito lobis 4 abbreviatis deltoideis villosulis; *staminibus* (anne semper?) 4; *stylis* 2 basi breviter connatis; *fructu* brevi quadrato apice truncato villosuloque spinis divaricatis 4 (quorum extant 2 elongatæ, 1 intermedia, quarto vero minima).

Mulline; *Maryon.*

Folia ± 4 mm. long., primo ascendentia, demum patentia. *Flores* perplurimi. Styli rami inferne breviter barbellati, fere 1 mm. long. Fructus 1 mm. long. et lat.; spini longiores 5–7 mm. long; spina intermedia recta vel uncinata, circa 2 mm. long.; minima debilis, incurvus, circiter ·5 mm. long.

A very distinct species, known from its congeners by means of the hispid-villous foliage.

PHYTOLACCACEÆ.

Gyrostemon Brownii, sp. nov. Frutex glaber habitu fastigiato; *ramulis* gracilibus angulosis foliosis; *foliis* sessilibus subteretibus angustissime linearibus apice mucronulatis; *stipulis* exiguis deltoideis acutis; *floribus* in racemos paucifloros foliis certe brevioribus digestis; *pedicellis* quam calyx longioribus minute bracteatis; *perianthio* breviter 5-lobo microscopice farinoso lobis rotundatis; *fll. masc.* staminibus 7–8 uniseriatis discum sat eminens apice truncatum breviterque 5-lobum cingentibus; *fll. fem.* carpellis 4–5 ovoideis obtusis scabriusculis; *stylis* brevibus late subulatis crassiusculis columnæ centrali brevi affixis; *fructu* ——.

Bruce Rock; *Stoward*, 704 (♂), 745 (♀).

Folio ± 15 mm. long., circa ·5 mm. lat., in sicco viridia; stipulæ (uti bracteæ) decolores longit. 1 mm. nunquam excedentes. Racemi adusque 5–6 mm. long., etsi sæpe breviores. Pedicelli fll. masc. ± 2·5 mm. long.; fll. fem. 1·5–2 mm. Fll. masc. perianthium 2·5 mm. diam.; fll. fem. 2 mm. Antheræ a latere aliquanto compressæ, 1–2 mm. long. Discus ·5 mm. diam. Carpella vix 2 mm. long., styli fere 1 mm.

A very distinct species with, as chief marks, the short racemose inflorescences, the few stamens and carpels, and the short stigmas.

The plant has been named in recognition of Mr. G. W. Brown's excellent collecting work at Kauring.

PROTEACEÆ.

Isopogon scabriusculus, Meisn. Nungarin; *Stoward*, 415.

Grevillea insignis, Kipp. Kauring; *G. W. Brown* (Hb. Stoward, 755).

GREVILLEA (§ *Eriostylis*) LYCOPODINA, sp. nov. Fruticosa, crebro ramosa, floribus exemptis glabra; *ramulis* rigidis arrecto-ascendentibus junioribus foliis omnino obtectis; *foliis* parvulis imbricatis inferneque cauli applicatis linearibus appendice filiformi rigidiusculo fusco cum folio angulum fere rectum efficiente onustis facie planis leviterve concavis dorso aliquantulum rotundis necnon sulco centrali percursis; *floribus* in umbellas sessiles paucifloras axillares vel terminales dispositis; *pedicellis* folia bene superantibus superne leviter dilatatis albo-villosis; *perianthii* albo-villosi segmentis linearibus apice suborbicularibus; *toro* recto; *glandula* obsoleta; *ovario* brevissime stipitato albo-villoso; *stylo* quam stipes plane longiore incurvo albo-villoso sursum claviformi apice laterali ambitu orbiculari stigma centricum breve anguste conico-cylindricum gerente; *folliculo* oblongo apice breviter rostrato pubescente.

Kauring; *G. W. Brown* (Hb. Stoward, 614).

Folia 4 mm. long., horum appendix 1–2 mm. long., in sicco læte viridia. Pedicelli usque ad 8 mm. long. Perianthii segmenta modo 3 mm. long.; antheræ ·6 mm. Stipes ·5 mm. long. Ovarium 1 mm. diam. Stylus apice excluso 3 mm. long., apex 1 × 1 mm. Folliculus 10 × 4 mm., unicus scrutatus monospermus. Semen lineari-oblongum, ala brevi apicali necnon in marginem angustissime extenuata præditum, 7·5 mm. long.

Easily recognised by the leaves. The affinity is with *G. oxystigma*, Meisn. and *G. uncinulata*, Diels: there are besides several floral peculiarities which need not be dwelt upon.

G. teretifolia, Meisn. Bruce Rock; *Stoward*, 446.

G. acerosa, F. Muell. Bruce Rock; *Stoward*, 476. Specimen somewhat off type, the umbels standing on pedicels up to 3 mm. in length and the flowers being larger.

G. integrifolia, Meisn. Kauring; *G. W. Brown* (Hb. Stoward, 638).

G. INTEGRIFOLIA, Meisn., *var.* GRANDIFLORA, var. nov. A typo abhorrens de floribus manifeste majoribus longiusque pedicellatis. *Pedicelli* 3 mm. long.

Perianthium 6 mm. long.; hujus pars dilatata 2 mm. long. *Conus stigmaticus* 1·5 mm. long.

Nungarin; *Stoward*, 289.

GREVILLEA (§ *Conogyne*) FLABELLIFOLIA, sp. nov. Verisimiliter frutex; *ramulis* erectis rigidis crebro foliosis costis glabris foliorum basin continuationem efformantibus exemptis pubescentibus deinceps glabrescentibus; *foliis* sessilibus obovatis apice flabellatim inæquialte 5–7-lobis (lobis arrectis oblongis breviter pungenti-acuminatis) basi cuneatis nervis pag. inf. insigniter prominentibus in sicco dilute viridibus coriaceis subtus nervis exclusis pubescentibus; *floribus* in racemos terminales breviter pedunculatos densifloros foliis longioribus uti pedicelli breves pubescentibus digestis; *perianthii* subtiliter sericei sub limbo recurvi segmentis oblongis sursum attenuatis apice ovatis; *toro* recto; *glandula* prominente unilaterali; *ovario* sessili aliquanto inæquilaterali sericeo-villoso; *stylo* elongato complanato glabro sub cono stigmatico maxime abbreviato convexo horizontaliter dilatato.

Nungarin; *Stoward*, 414.

Folia 1·5–2 cm. long., sub apice 8–17 mm. lat.; lobi plerique 4–8 mm. long. Racemi 4·5 cm. long., circa 1 cm. diam.; horum pedunculus circa 5 mm. long. Pedicelli 1 mm. long. vel paullulum ultra. Perianthii segmenta 9 mm. long., pars dilatata 1·25 mm. Glandula ægre 1 mm. long. Ovarium 1·5 mm. long. Stylus fuscus 14 mm. long.

A very distinct species: *G. apiciloba*, F. Muell., is probably near it, though in leaf and in flower there are several important differences.

Persoonia quinquenervis, Hook. Kauring; *G. W. Brown* (Hb. Stoward, 517).

P. Saundersiana, Kipp. Bruce Rock; *Stoward*, 441.

EUPHORBIACEÆ.

MONOTAXIS (§ *Hippocrepandra*) STOWARDII, sp. nov. Suffrutex graciliter ramosus glaber; *ramulis* tenuibus foliosis; *foliis* sessilibus brevissimeve petiolatis anguste lineari-lanceolatis apice mucronulatis basi acutis vel obtusiusculis margine revolutis subcoriaceis; *stipulis* parvulis subulatis diutule persistentibus; *floribus* (anne semper paucis ♂ et ♀?) fasciculatis pedunculis gracilibus bracteis exiguis basi stipatis insidentibus; *sepalis* masc. 5 oblongo-ovatis obtusiusculis; *petalis* sepalis paullo longioribus iisque subsimilibus basi unguiculatis; *staminibus* 10 filamentis filiformibus petalis vix æquilongis; *sepalis* ♀ ovato-oblongis obtusis quam petala ovata parum brevioribus; *ovario* globoso stylis abbreviatis sparsim breviterque cristatis coronato.

Trayning; *Stoward*, 292.

Folia ±1 cm. long., 1·5–3 mm. lat., in sicco viridia; costa media pag. inf. perspicua. Stipulæ circa 1 mm. long. Pedunculi 2–3 mm. long. Sepala masc. 1·5 mm., petala 2 mm. long. Filamenta 1·5 mm. long.; antherarum loculi ·3 mm. long. Ovarium paullulum ultra 1 mm. diam., glabrum. Styli purpurei, modo ·5 mm. long.

Near *M. gracilis*, Baill.; distinguished by the small flowers, especially female ones; the latter with very short styles. The leaves are of the bifacial kind with stomata chiefly on the underside.

CASUARINACEÆ.

Casuarina (§ *Acanthopitys*) Stowardii, sp. nov. *Ramulis* erectis gracilibus microscopice puberulis internodiis 1 fere 2 cm. long. striis pæne evanidis in dentes 14–15 abbreviatos subulatos ciliolatos productis percursis; *strobilis* anguste ovoideis; *bracteis* late ovatis dorso incrassatis necnon fulvo-villosis apice lignescentibus subitoque pungenti-acuminatis; *bracteolis* bracteas breviter superantibus oblongis apice acumine pungenti integro vel bifido acuminatis dorso carinatis inappendiculatisque appresse fulvo-villosis; *seminibus* oblongo-obovatis acutis testa sordide alba.

Nungarin; *Stoward*, 743.

Ramuli 1 mm. diam. Nodorum dentes tenaces, inferne dilutissime flavi, superne fusci, 1 mm. long. Flores non suppetunt. Strobilus 2·8 × 2 cm. Bracteæ 7·5 mm., bracteolæ 9 mm. long. Semina 8 mm. long.; ala sola 5 × 2 mm.

Judging from the description evidently close to *C. acutivalvis*, F. Muell.; differing from it chiefly in the 14–15-toothed nodes with considerably shorter and rigid teeth, the smaller cones, and the oblongo-obovate acute wing to the seeds, this suggesting diversity in the shape of the bracteoles, though the point does not emerge in Mueller's description.

Casuarina (§ *Trachypitys*) leptotrema, sp. nov. Ramulis erectis mediocriter striatis glabris internodiis ± 4 mm. long. dentibus pro nodo 6 abbreviatis deltoideis acutis; *strobilis* late cylindricis raro subglobosis glabris; *bracteis* parvulis (sc. apice solo triangulari acuminato emergente); *bracteolis* apice brevissime productis dorso lignescentibus tuberculisque 3–4 parvis paullulum eminentibus obtusissimis onustis post dehiscentiam spatium anguste ellipticum relinquentibus; *seminibus* oblongo-obovatis apice truncatis medioque subito mucronulatis brunneis.

Nungarin; *Stoward*, 742.

Ramuli 1 mm. diam. Nodorum dentes vix ·5 mm. long., pallide brunnea. Strobili plerique 20 × 12 mm., nonnunquam paullo longiores brevioresve. Bractearum pars emergens 1 mm. vix attingens. Bracteolarum culmen

circa ·2 mm. alt. Spatia intervalvaria 2 × 1 mm. Semina 4 mm. long.; ala sola 2 × 2·5 mm.

This can be distinguished from *C. humilis*, Otto & Dietr. by the less markedly striate branches with six (not four) teeth at the nodes, the narrower cones with less prominent dorsal tubercles to the bracteoles, and the narrow opening left between the bracteoles on escape of the smaller light brown (instead of black) seeds which are provided with a narrower wing.

III. Some New or Rare Australian Species of Older Collections.

This part of the memoir is devoted almost exclusively to notice of plants communicated by travellers at various times during last century, and will, it is trusted, prove the forerunner to another, possibly others, of similar nature. It will be convenient, and perhaps may not be without interest, to notice shortly the chief collectors whose names appear in the following pages, with the more reason inasmuch as some of these names are omitted from the official 'History of the Collections contained in the Natural History Departments of the British Museum.'

Armstrong, J. Was at Port Essington in 1840. There is a fair set of his plants at the Museum, though not so good as that at Kew; but the Museum set contains here and there a species not in the Kew herbarium.

Brown, Robert. The full set of this, perhaps the most important of all Australian collections, is of course at the British Museum. A large number of Brown's plants are also at Kew presented under the terms of the J. J. Bennett bequest in 1872.

Bynoe, Benjamin. Surgeon on the 'Beagle' 1837–43; better known as having acted in a similar capacity on the same ship during the subsequent voyage immortalized by Charles Darwin. In the preface to 'Flora Australiensis,' Bentham regrets the want of funds which prevented the plants collected by the "officers of the 'Beagle' under Captain Wickham and Captain Stokes" being made available for examination at the Museum. There was, however, no reason for this regret, since examination of the consignment and comparison of its contents with the Bynoe plants at Kew show the two collections to be essentially the same, though with specimens missing here and there from one or the other. There seems little reason to doubt, therefore, that the "officers" alluded to above were really concentrated in the person of the surgeon, and this view has been adopted on the Museum labels.

Cunningham, Allan. Bearing in mind that Cunningham owed his position largely to the offices of Banks, it is only natural to find his devoted services as collector well in evidence at the Museum. The reader may be reminded how, after accompanying the first Oxley expedition into the interior of New South Wales (1817), Cunningham joined Captain King of the 'Mermaid' in the succeeding year, a second expedition under the same commander following in 1819, in 1820 a third, and a fourth, also under Captain King but this time in the 'Bathurst,' a somewhat larger and more convenient vessel, in 1821–2. Though the most valuable of Cunningham's collections were made during these four expeditions which touched at various points in the eastern, northern, and western parts of the island-continent, he made several overland journeys in subsequent years, notably those to Moreton Bay in 1827–9. Together with the original manuscripts and correspondence relating to them, a large proportion of the specimens amassed as above-mentioned are at the Museum ; but though a certain percentage had many years ago been made available for study, there remained a large number to be dealt with, and even now the work is not quite finished. Fortunately this was not a matter of such importance as might have been the case, owing to Kew's acquirement of Cunningham's own herbarium through the generosity of his friend Heward. Nevertheless the two herbaria though closely parallel are not identical, there being reciprocal absentees from both. It was unfortunate that Cunningham, instead of a current enumeration, adopted the unsatisfactory plan of numbering each collection separately; this was probably the reason for Bentham's neglecting to cite this botanist's numbers, although he quotes Drummond's, who worked on the same method. Cunningham's practice has entailed much labour and loss of time in ascertaining from his manuscripts the locality and other details relating to his material, since the tracing out of a number frequently involved scrutiny of many lists, often indeed of all, and even then sometimes without result.

Mr. Maiden's paper, "Records of Western Australian Botanists" (Journ. W. Austral. Nat. Hist. Soc. vi. pp. 5–27), it may be noted, does not include Cunningham's name, although both in 1818 and 1821–22 King George's Sound and other places in the South-West were visited.

Daemel, E. Collected many years ago in the Cape York peninsula. What seems to be a good set was purchased of a "naturalist" named Huggins in 1868, as was probably that at Kew.

De Bouley. The only reference obtained to this collector is in a letter of George Maxwell to Kew. In 1872 Maxwell writes that he is sending a few seeds "which Mr. De Bouley has kindly undertaken to deliver." The collection was made in the north-west part of the colony, and, as might be expected, contains much of interest besides here and there a new species.

Fraser, Charles. Accompanied Oxley's N.S. Wales Survey Expedition 1817–18. Was at Moreton Bay in 1828, and in the preceding year at King

George's Sound. Forgetfulness of the last-mentioned fact has led Bentham to localize *Trichinium Fraseri*, A. Cunn., as a N. S. Wales plant, whereas it is really a South-Western species. This name, too, is omitted from Mr. Maiden's useful "Records" above noted.

GILBERT, JOHN. Besides plants, collected bird-skins for Gould the ornithologist; the Museum has a considerable number of his South-Western plants. Bentham cites this name but rarely and never with the number, although, for instance, Meisner (DC. Prod. xiv. *passim*) had previously done so where possible.

LEA, *Rev.* T. S. Will be remembered as the companion of Messrs. Ridley and Ramage on their visit to Fernando Noronha in 1887. Mr. Lea was in South Australia in the latter half of 1885, and during the succeeding year he visited North Australia and Queensland. His plants, amounting to nearly 1400, especially those from Palmerston, Adelaide River, and Pine Creek, chosen with judgment and well preserved, are often of great interest and value.

LEICHARDT, F. W. L. In the not very large collection of this traveller's plants, those of most interest are from North Australia.

LESCHENAULT DE LA TOUR. Botanist to the Baudin Expedition at the beginning of the last century. A set of his plants communicated from the Paris Museum in 1816 includes a few co-types of great value. The most interesting of this collector's plants are from the Shark's Bay District, a locality his fellow-countryman Gaudichaud also visited a few years afterwards. Both these names are omitted by Mr. Maiden.

MACGILLIVRAY, J. Botanist to various Australian expeditions. The Museum has a set of his plants dated 1842 when on the 'Fly,' Sandy Cape and Port Bowen being the localities.

MAXWELL, G. Collected in South-West Australia, mainly in the Mount Barren coastal region. Though the bulk of his plants went to Melbourne, whence Mueller communicated many to Kew, a large number found their way to the Museum, including a numbered set dated 1861, the rest being without numbers. A certain proportion of these are not at Kew, including here and there a species (and one genus) new to science. Specimens subsequently collected (1872–8) were presented to the Museum by Mr. J. Cosmo Melvill.

MITCHELL, *Sir* T. The Museum has nearly 500 of this well-known traveller's specimens, which are often the more valuable from having attached to them dated labels enabling the localities to be ascertained upon reference to the explorer's second work, that of 1848.

PODENZANA, G. Collected at various places in Queensland and New South Wales, 1891–3.

CELASTRACEÆ.

Psammomoya choretroides, Diels & Loes. This remarkable plant, only recently assigned to its true place, was collected by Gilbert three-quarters of a century ago; unfortunately the locality is unknown, the label having gone astray. The species, it may be mentioned, is also represented at the Museum by the following:—Quellington; *C. Andrews*, 646. Bruce Rock; *Stoward*, 420. Nungarin; *Id.*, 466.

Curiously enough Mueller originally described this as a *Logania*!, though how so accomplished a botanist fell into this error is incomprehensible.

SAPINDACEÆ.

Distichostemon filamentosus, sp. nov. *Ramis* tenuibus foliosis sparsim pubescentibus; *foliis* oblongis vel oblongo-lanceolatis (raro anguste oblongo-ovatis) apice acutis obtusisve nonnunquam obtusissimis basi in petiolum manifestum angustatis margine crenato-dentatis crenulatisve interdum integris membranceis sparsim ciliatis ceteroquin glabris; *floribus* paucis polygamis terminalibus vel ex axillis summis ortis longipedunculatis; *sepalis* 6–8 lanceolatis acutis extus puberulis; *staminibus* verisimiliter saltem 20 antheris oblongis filamentis sibi ipsis æquilongis insidentibus; *ovario* velutino; *capsula* ambitu late obtriangulari triquetra alis tribus quam valvæ angustioribus inferne imminutis prædita valvis a dissepimento dehiscentibus.

N. Australia, Palmerston; *Rev. T. S. Lea.*

Folia pleraque 2·5–4 cm. long., 8–15 mm. lat. (raro 6 × 2 cm.), in sicco viridia; petioli 3–10 mm. long. Pedicelli 5–25 mm. long., nonnunquam adusque 4 cm. Sepala tandem reflexa, 4–5 mm. long. Filamenta gracillima, 2–3·5 mm. long.; antheræ 3–3·5 mm. long. Ovarium 3 × 4 mm. Capsula subtiliter velutina, 10 mm. long., sursum circa 15 mm. lat.; alæ capsulæ æquialtæ, summum 5 mm. lat. Semina nigra nitentia, 2 mm. long.

A curious plant more like *Dodonæa* than *Distichostemon*, but the calyx and the numerous stamens must keep it out of the former genus. The anthers on comparatively long filaments is a character neither of *Dodonæa* nor of *Distichostemon*, and may perhaps indicate a distinct genus, if indeed all the species may not with more propriety be included in *Dodonæa.*

The material is not quite satisfactory, so that the precise number of stamens was not ascertained; but judging from the scars left upon the slightly elevated receptacle, there are some 20 of them—at least in most cases.

ANACARDIACEÆ.

Euroschinus parvifolius, sp. nov. *Ramulis* subteretibus subtiliter ferrugineis; *foliis* 2–3-jugis rhachi gracili ut petioluli ferruginea foliolis oblongo-ovatis apice sæpissime breviter cuspidulato-acuminatis basi obliquis

pergamaceis supra glabris subtus in axillis nervorum proximis pilosis; *paniculis* axillaribus terminalibusve foliis sæpius brevioribus ferrugineis; *floribus* pedicellis perbrevibus carnosis insidentibus; *calycis* lobis ovatis obtusis glabris; *petalis* ovato-oblongis obtusis calycem longe excedentibus; *filamentis* subulatis antheris circiter æquilongis; *ovario* subgloboso glabro in stylum crassum abeunte; *stylis* apice modo liberis.

Hab. Queensland, Cumberland Islands; *R. Brown,* dist. no. 5424.

Foliorum rhachis usque ad 4·5 cm. long. Foliola 3–4 cm. long., rarius adusque 5 cm., 1·2–2 cm. lat., in sicco brunnea, maxime inæquilatera, obscure venosa. Paniculæ circa 3·5 cm. long. Calyx totus 1·2 mm. long., hujus lobi ·4 mm. Petala concava, 2·5 mm. long. Filamenta fere 1 mm. long.; antheræ oblongæ. Discus perspicuus, lobulatus. Ovarium 1·2 mm. diam. Stylus fere 1 mm. long.

The genus consists of some half-dozen species, most of which are New Caledonian. The above-described is the second Australian species, differing from *E. falcatus,* Hook f. chiefly in the small leaflets pilose on the underside in the axils of the lower nerves, the short panicles, narrow petals, and large globular ovary.

R. Brown's dist. no. 5422 (*E. falcatus,* Hook. f. var. *angustifolius,* Benth.) has leaflets more like those of *E. parvifolius* than of the type, but its inflorescences are those of typical *E. falcatus.*

MYRTACEÆ.

Verticordia Fontanesii, DC., var. *brachyphylla,* Diels. This variety was founded on Pritzel 820, from the Avon district of West Australia: Drummond's 29 of the 3rd coll. is the same thing. Owing to its reduced leaves, short peduncles, and greatly divided calyx-lobes this looks different from the typical examples, but a series shows intermediates in all these respects. This is no doubt a very variable species.

V. Forrestiana, F. Muell. Fine specimens of this rare plant were presented a few years ago to the Museum by Miss De Pledge. So far as Miss De Pledge was able to ascertain, the plant grows exclusively on the sides of sandhills about 80 miles inland from the town of Onslow, never apparently descending to the surrounding flats. The colour of flowers varies from white through all shades of pink to a deep blackberry red, this being one of the few pink-flowered plants found in those parts, the prevailing colour being pale mauve. A photograph accompanied the material.

Calythrix Wickhamiana, sp. nov. Copiose ramosa, glabra; *ramulis* tenuibus frequenter foliosis inferne crebro cicatriciferis; *foliis* pusillis primo imbricatis lanceolatis acutis dorso acute carinatis glandulis perpaucis inspersis; *floribus* in axillis superioribus solitariis subsessilibus; *bracteolis* medium usque connatis obtusissimis; *calycis* tubo bracteolas facile superante superne anguste cylindrico cavoque dimidio inf. fusiformi lobis parvis orbicularibus sat longe aristatis; *petalis* lanceolatis acutiusculis stamina excedentibus; *staminibus* ultra 25; *stylo* inferne calyce incluso.

North Australia, Victoria River; *Bynoe.*

Folia 1–1·5 mm. long. Bracteolæ 4 mm., pedicelli 1 mm. long. Calyx in toto 8 mm. long.; pars libera 4 × 6 mm.; pars inf. juxta medium fere 1 mm. lat.; lobi 1·5 × 1·5 mm.; arista 7 mm. long. Petala 6 mm., filamenta 4 mm., stylus 8·5 mm. long.

This has the leaves of *C. conferta,* A. Cunn., but the narrow calyx-tube removes it from that and neighbouring species. The affinity is with *C. Oldfieldii*, Benth.

CALYTHRIX MITCHELLII, sp. nov. Fruticulus, copiose ramosus, glaber; *ramulis* ultimis satis intricatis bene foliosis; *foliis* parvulis subteretibus (dorso carinulatis) oblongis obtusis glandulis perpaucis obsitis; *floribus* subsessilibus ex axillis summis oriundis; *bracteolis* calyce multo brevioribus circa usque medium connatis obtusissimis; *calycis* tubo cylindrico superne cavo longitrosum striato lobis subrhombeis in aristam sese duplo excedentem extenuatis; *petalis* oblongo-lanceolatis stamina subæquantibus; *staminibus* circa 12?; *stylo* inferne calyce incluso usque ad placentam continuo.

Queensland, near Mt. Faraday; *Mitchell*, 394.

Folia 1·5 mm. long., in sicco griseo-viridia. Pedicelli ægre 1 mm. long. Calyx 6·5 mm. long., ·6 mm. lat.; pars inf. 3 mm., pars sup. 3·5 mm. long.; lobi 2 mm., arista 4 mm. long. Petala 3·5 mm. long. Stamina summum circa 3 mm. long.

Near the Northern *C. microphylla*, A. Cunn., but larger in the foliage with obtuse not acute bracteoles, shorter calyx, and quite different petals and stamens. Under the date Oct. 9th, Mitchell ('Trop. Australia,' p. 345) alludes to this plant in the following words: "A small shrub grew on the rocks, a pretty little *Calythrix* near *C. microphylla,* A. Cunn. (from Port Essington and Melville Island); but the branches with their leaves are more stout and the bracts more obtuse. Sir W. Hooker supposes it to be a new species."

In the Kew herbarium this is written up as "*C. microphylla*, A. Cunn.," though left unnoticed in Fl. Austral. iii. 49. The foliage of the two is at once seen to be quite different.

C. megaphylla, F. Muell. N. Australia, Victoria River; *Bynoe.* Except for the slightly narrower leaves agrees well with the specimen of this at Kew.

CALYTHRIX INTERSTANS, sp. nov. Verisimiliter suffrutex, glaber, copiose ramosus; *ramulis* tenuibus inferne mox cicatricibus prominentibus foliorum mortuorum ornatis; *foliis* parvulis imbricatis lineari-lanceolatis apice albo-mucronulatis dorso acutiuscule carinatis necnon linea glandularum perpaucarum comparate magnarum indutis margine microscopice cartilagineo-ciliolatis coriaceis; *floribus* saltem in sicco dilute purpureis ex axillis hac atque illac ortis subsessilibus; *bracteolis* medium usque connatis breviter acuminatis dorso scabriusculis calycem circiter semiæquantibus; *calycis* tubo satis elongato infundibulari superne cavo lobis late ovatis ciliolatis in aristam quam sese longiorem extenuatis; *petalis* oblongo-spathulatis acutis calycis lobos paullum excedentibus; *staminibus* circa 20; *stylo* inferne calyce incluso.

N.W. coast; *De Bouley*.

Folia 1·5–2 mm. long., in sicco griseo-viridia. Bracteolæ 5·5 mm., pedicelli 1 mm. long. Ovarium 4·5 mm. long., inferne 1 mm., apice 1·5 mm. lat. Calycis pars libera 2·5 mm. long., fere 2 mm. lat.; lobi 2 mm., horum arista 6 mm. long. Petala prope basin 1·5 mm., superne ægre 3 mm. lat. Stylus 12 mm. long.

To be inserted between *C. conferta*, A. Cunn. and *C. arborescens*, F. Muell., with the foliage of *conferta* but, among other features, an entirely diverse calyx-tube.

MICROMYRTUS PELTIGERA, sp. nov. Copiose ramosa, glabra; *ramulis* tenuibus omnimodo foliosis albis; *foliis* pusillis cauli arcte appressis orbicularibus vel suborbicularibus carnosis glandulis perpaucis prominulis ornatis primo imbricatis subinde paribus inter sese sat distantibus; *floribus* in axillis superioribus sessilibus; *calycis* tubo breviter campanulato obscure 5-costato subevanide foveolato lobis subreniformibus tubo brevioribus; *petalis* obovatis margine leviter undulatis quam calycis lobi duplo longioribus; *staminibus* 10 subglobularibus poris dehiscentibus; *ovulis* 5–7 placentæ crassiusculæ apicali affixis.

Coolgardie district; *Webster*.

Folia 1 mm. long., rarius 1·5 mm. attingentia, in sicco griseo-viridia. Bracteolæ caducæ. Calycis tubus 1·5 mm. long., superne totidem diam.; lobi ·8 × 1·5 mm. Petala 1·5 mm. long. Stigma 1 mm. long.

This is very close to *Micromyrtus rosea*, comb. nov. (*Thryptomene rosea*, E. Pritz.), but a close scrutiny of its curious little shield-like leaves will at once show it to be different. There are also floral discrepancies.

Baeckea ramosissima, A. Cunn., in Field's N. S. Wales, p. 349 (1825), is not noticed in the 'Flora Australiensis'; it is founded on Cunningham's No. 5 of the 1822 coll., and comes from the Blue Mountains. In every way conspecific with *B. diffusa*, Sieb. in DC. Prod. iii. 230 (1828), Cunningham's name must take priority over Sieber's.

LEPTOSPERMUM (§ *Euleptospermum*) MAXWELLII, sp. nov. Verisimiliter frutex; *ramulis* foliosis ultimis brevissimis primo microscopice sericeis cito glabrescentibus; *foliis* parvis oblanceolatis apice obtusissimis ipso obscure mucronatis basi in petiolum brevissimum angustatis coriaceis glabris utrobique glandulis leviter eminentibus crebro inspersis; *floribus* 1–2 sub apice ramulorum ultimorum plane pedicellatis; *bracteolis* fugaceis; *calycis* tubo campanulato crassiusculo ruguloso glabro vel potius obscure pruinoso lobis triangulari-deltoideis obtusiusculis ciliolatis quam tubus paullulum brevioribus; *petalis* breviter unguiculatis suborbicularibus calycis lobis longioribus; *staminibus* circa 15; *ovario* 5-loculari; *ovulis* quove in loculo ∞.

W. Australia, Fitzgerald River; *Maxwell*, 202.

Folia pleraque 4–7 mm. long., apicem versus 2–3 mm. lat., obscure trinervia, in sicco griseo-viridia. Pedicelli circa 3·5 mm. long. Calycis tubus 2 mm. long., apice totidem lat.; lobi 1 mm. long. Petala vix 3 mm. diam. Capsula ignota.

In several respects remarkably like the Tasmanian, *L. rupestre*, Hook. f., but more slender in habit and with smaller pedicellate flowers having somewhat different calyx-lobes.

LEPTOSPERMUM (§ *Euleptospermum*) FASTIGIATUM, sp. nov. *Ramulis* strictis etsi gracilibus foliosis tuberculis parvis obsitis glabris; *foliis* parvis ovato-oblongis apice obtusissimis ipso mucronatis basi in petiolum brevissimum cuneatim angustatis trinervibus coriaceis primo subtiliter albo-sericeis cito glabris; *floribus* axillaribus subsessilibus pedicellis basi bracteas paucas minutas ovatas fulcientibus; *calyce* campanulato in longitudinem costato appresse albo-sericeo lobis deltoideis acutis tubo brevioribus; *petalis* suborbicularibus calycis lobos manifeste excedentibus; *staminibus* circa 28; *ovario* 3-loculari ovulis quove in loculo ∞; *stylo* brevi stigmate parvo peltato terminato.—*L. Roei*, Diels & Pritz. in Engl. Bot. Jahrb. xxxv. (1904) 640, non Benth.

Coolgardie Goldfield in open sandy places; *Pritzel*, 844.

Folia 5–9 mm. long., summum 3 mm. lat., in sicco pallide viridia. Bracteæ mox evanidæ, circa ·5 mm. long. Pedicellus 1 mm. long. Calycis pars adnata 1·5 mm., pars libera 1 mm. long.; lobi 1 mm. long. Petala alba, 2·5 mm. diam. Stylus ·75 mm. long.

To this belong specimens collected by Webster in the Coolgardie district, as also Thiselton-Dyer, 38, from near Dedari (this last in the Kew Herb.). The Kew material has been assigned to *L. myrtifolium*, Sieb., an East Australian species with 5-celled ovary.

L. Roei, Benth., has larger flowers with a villous calyx; also conspicuous scarious bracts.

Leptospermopsis, *Myrtacearum* e tribu Leptospermearum, gen. nov.

Calycis tubus campanulatus, triente sup. ab ovario liber; lobi 5, membranacei, imbricati sed citissime aperti. *Petala* 5, calycis lobos excedentia, patentia. *Stamina* 5, petalis stricte opposita; filamenta brevia, inflexa; antheræ versatiles loculis in longitudinem dehiscentibus. *Ovarium* inferum, 5-loculare; ovulis quoque in loculo pluribus (circa 16) biserialibus. *Stylus* brevis, crassiusculus, foramini ad apicem ovarii insertus. *Stigma* capitatum. —Verisimiliter frutex, glaber. *Folia* alterna, parva. *Flores* axillares, pedicellati, pedicellis basi bracteis minutis stipatis.

Leptospermopsis myrtifolia, sp. unica. (Pl. **11**. B.) *Ramulis* sat tenuibus aliquanto anfractuosis ramulos breves foliosos floriferosque satis approximatos emittentibus; *foliis* subsessilibus obovatis obtusissimis basi angustatis coriaceis trinervibus (nervis lateralibus sæpe maxime inconspicuis) coriaceis; *floribus* pedicellis crassiusculis calycem facile excedentibus suffultis; *calycis* tubo striato minutissime sparsissimeque puberulo quam lobi deltoidei acutiusculi paullo longiore; *petalis* orbicularibus; *filamentis* basi dilatatis; *stylo* incluso.

S.W. Australia; *Maxwell.*

Folia 4–5 mm. long., prope apicem 2 mm. lat., pag. inf. aliquando perspicue trinervia, pag. sup. plerumque enervosa, utrinque glandulis parvis fuscis crebro inspersa. Pedicelli ipso sub flore leviter incrassati, circa 4 mm. long.; bracteæ ·6 mm. long. Calycis tubus 2 mm. long. (pars libera ·6 mm.); lobi 1 mm. long. Petala fere 3·5 mm. diam. Filamenta 1 mm., antheræ ·2 mm., stylus 1 mm. long.

The number and arrangement of the stamens is so important a feature among the myrtaceous genera peculiar to Australia, or almost so, that no apology is needed for adopting the step here taken of describing this as the type of a new genus, although it differs from *Leptospermum*, the species of which in general appearance it closely resembles, only in the andrœcium.

The characters of the genera of alternate-leaved Leptospermeæ may be shown as follows:—

Flores capitulati. Ovuli in loculis pauca .... *Agonis.*
Flores haud capitulati.
  Stamina 10–30. Ovula in loculis indefinita (raro 4–8) ...... *Leptospermum.*
  Stamina 5, petalis opposita. Ovula in loculis indefinita ...... *Leptospermopsis.*

Kunzea eriocalyx, F. Muell. ex descript. On the Ranges near Middle Mount Barren; *Maxwell*, 137. There is no specimen of this at Kew. Bentham saw only a small fragment from Baron Mueller's herbarium.

Kunzea (§ *Eukunzea*) affinis, sp. nov. *Innovationibus* albo-sericeis citissime glabrescentibus; *ramulis* ultimis brevibus omnimodo vel superne solum foliosis ; *foliis* subsessilibus linearibus obtusis subteretibus (pag. sup. applanatis) crassiusculis sat perspicue glandulosis ; *floribus* subsessilibus 2- vel 3-nis (anne semper ?) ad apicem ramulorum sitis ; *bracteis* parvulis calyci multo brevioribus ovatis obtusissimis vel obtusis scariosis ; *calycis* tubo campanulato 5-costato quam lobi suborbiculares longiore ; *petalis* suborbicularibus late breviterque unguiculatis ; *staminibus* biserialibus ; *ovario* 5-loculari ovulis quove in loculo 8 ; *stylo* exserto.

Arid plains, Gardner and Fitzgerald Rivers ; *Maxwell*, 211.

Folia 4–6 mm. long., ·5–·8 mm. lat. ; petioli summum vix 1 mm. long. Bracteæ 1–2 mm. long., pedicelli ·5 mm. Calycis pars adnata 1·5 mm., pars libera 1 mm., lobi 1 mm. long. Petala rosea, 2·5–3 mm. diam. Filamenta circa 3 mm. long. Stylus crassiusculus 4·5 mm. long.

At first sight and without dissection this might be taken for *K. pauciflora*, Schauer, of which it has the foliage and general appearance. Dissection shows, however, the following peculiarities : bracts much shorter than those of *pauciflora* and a shorter campanulate (not ovoid) calyx with quite different lobes. The leaves are somewhat stouter than those of *pauciflora*, and the flowers a little smaller. It may be added that although Bentham says the flowers of the older species are sessile, those examined had pedicels of more than 1 mm. in length, and a pedicel is obviously necessary to support the bracts.

KUNZEA (§ *Eukunzea*) SPICATA, sp. nov. *Innovationibus* microscopice sericeis cito glabris ; *ramulis* ultimis folia primo conferta deinde sparsa fulcientibus ; *foliis* parvis late obovatis obtusissimis crassiusculo-coriaceis cito glabris petiolo brevi latoque insidentibus ; *floribus* sessilibus in spicas breves ad vel juxta ramulorum partem intermedium sitas ordinatis ; *calycis* tubo subhemisphærico crassiusculo levi vel fere levi quam lobi oblongo-ovati obtusi vel obtusissimi paullulum longiore ; *petalis* suborbicularibus late breviterque unguiculatis ; *ovario* 5-loculari loculis circa 5-ovulatis.

West Mt. Barren and Fitzgerald River ; *Maxwell*.

Folia usque ad 3 × 2·5 mm., plerumque vero paullo minora, pag. utravis perspicue glandulifera, in sicco sæpe longitrorsum rugulosa ; petiolus ·5 mm. long. Spicæ florentes summum 12 × 9 mm. Calycis tubus 2·5 mm. long. (pars inf. 1 mm. pars libera 1·5 mm.) ; lobi 1·5 mm. long. Petala rosea, 2 mm. diam. Filamenta verisimiliter biserialia, 2·5–3 mm. long. Stylus fere 5 mm. long.

Evidently very near *K. jucunda*, Diels, of which there is no specimen in this country. *K. jucunda* is described as having inflorescences of 2, 3, or 4 flowers at the top of the branchlets instead of the *Melaleuca* like interpolated inflorescences of the plant under notice ; moreover, its leaves are obovate-elliptic or suborbicular, the campanulate calyx is 10-nerved, and the cells of the ovary (number not stated) have 6–8 ovules.

Melaleuca (Series *Decussatæ*) Websteri, sp. nov. Fruticosa, glabra; *ramulis* ultimis crebro foliosis sat tenuibus, *foliis* oppositis (nonnunquam suboppositis) subsessilibus oblongo-lanceolotis deorsum ascendentibus sursum recurvis apice pungenti-acuminatis dorso convexis coriaceis; *florum* fasciculis subglobosis plerumque ex ramis jam defoliatis oriundis paucifloris; *calycis* campanulati coriacei lobis late deltoideis obtusis quam tubus plane brevioribus; *petalis* late ovatis obtusissimis concavis verisimiliter albis; *staminum* phalangibus ex ungue petala excedente constantibus additis antheris 12–20 filamentis quam unguis brevioribus insidentibus; *ovario* seminifero; *stylo* crassiusculo staminum phalanges leviter superante; *ovulis* pro loculo pluribus.

Coolgardie district; *Webster*. [Also at Kew, Dedari; *Thiselton-Dyer*, 40; Cowcowing; *Max Koch*, 1003.]

Folia plerumque 6–10 mm. long., 2 mm. lat., in sicco viridi-brunnea, dorso glandulis prominentibus crebro induta. Ovarium vix 2 mm. long. Calycis liberi pars indivisa fere 1 mm., lobi 1 mm. long. Petala 2·5 mm. long., vix totidem lat. Staminum phalangum unguis circa 4 mm. long.; filamenta 2 mm. long. vel minus; antheræ ·5 mm. long. Stylus 7 mm. long.

The Kew specimens alluded to above have been placed respectively with *M. eleutherostachya*, F. Muell., and *M. lateriflora* var. *acutifolia*, Benth.; but both these have alternate leaves, an important feature in the genus. Although much like the last named in habit and flower, the foliage, irrespective of its arrangement, is seen without difficulty to be dissimilar.

Melaleuca (Series *Laterales*) graminea, sp. nov. *Innovationibus* indumento subtili albo-sericeo vestitis; *ramulis* cito glabris foliosis tenuibus cortice dilute brunneo obductis; *foliis* alternis sessilibus linearibus apice pungenti-mucronatis 1–3-nervibus nervis sæpe obscuris necnon lateralibus evanidis primo albo-sericeis mox glabrescentibus; *floribus* in glomerulos axillares subsessiles plurifloros sphæroideos vel subsphæroideos ordinatis rhachi sericea fultis; *calycis* tubo campanulato sericeo quam lobi abbreviati rotundati longiore; *petalis* parvis suborbicularibus; *staminum* phalangum ungue petalis æquilongo filamentis 7–9; *ovario* fere omnino supero; *stylo* crasso andrœcium breviter superante; *ovulis* quove in loculo paucis placentæ brevi basali affixis.

N.W. Australia; *De Bouley*.

Ramuli sat intricati. Folia pleraque 4–6 cm. long., 2–3 mm. lat., in sicco griseolo-viridia. Glomeruli florescentes 8 mm. diam. Pedunculus sericeus, 1 mm. long. vel paullulum ultra. Calycis tubus 1·25 × 1·5 mm.; lobi modo ·5 mm. long. Petala longit. 1 mm. paullulum excedentia. Filamenta libera 1·5–2·5 mm long. Ovarium apice sericeum. Stylus 3·5 mm. long.

Evidently allied to *M. acacioides*, F. Muell., which has broader, obtuse leaves, a nearly globular calyx, longer staminal phalanges of which the claw is much longer than the petals, while the filaments attached to each are only 5–7 in number.

MELALEUCA (Series *Spicifloræ*) ARENICOLA, sp. nov. Verisimiliter frutex, crebro ramosus, glaber; *ramulis* ultimis tenuibus foliosis; *foliis* parvis alternis subsessilibus oblongis apice mucronatis basi obtusis facie sæpissime concavis crassiusculis; *floribus* in spicas axillares subglobosas oliganthas digestis; *calycis* subglobosi coriacei lobis abbreviatis deltoideis obtusis; *petalis* ovatis obtusissimis concavis; *staminum* phalangum ungue petala subæquante filamentis circa 10–12; *ovario* omnino infero; *stylo* crassiusculo ex staminum phalangibus haud eminente; *ovulis* plurimis; *fructu* parvo subgloboso ore nudo.

West Australia, Avon district, in sandy places; *Pritzel*, 825.

Folia plerumque 4–5 cm. long., 1 mm. vel paullulum ultra lat., in sicco viridia. Spicæ plerumque circa 7 mm. long. Calyx basi lata rhachi insertus, in toto (lobis ·3 mm. long. inclusis) 2 mm. long. Petala 2 mm. long. Staminum unguis 2·25 mm. long.; filamenta summum 3 mm. long.; antheræ ·35 mm. long. Stylus 5·5 mm. long. Fructus 2·5 mm. diam.

This has been listed (Engl. Jahrb. xxxv. 427) as *M. laxiflora*, Turcz. (*M. crassifolia*, Benth. of Fl. Austral.), undoubtedly its affinity. The small narrow leaves, short spikes, small crowded flowers, and the reduced and relatively narrow fruits are the chief features of this species.

Melaleuca cordata, Benth., Fl. Austral. iii. 149 (1866). Turczaninow had previously described this, curiously enough under the same trivial, in Bull. Acad. Imp. Sc. Pétersbourg, x. 339 (1852). This overlooked memoir contains no fewer than 77 descriptions belonging for the most part to Drummond's 5th set.

CALOTHAMNUS VALIDUS, sp. nov. (Pl. **11**. C.) *Ramulis* validis inferne cicatricibus orbicularibus sparsis onustis superne foliosis pubescentibus subinde glabrescentibus; *foliis* approximatis linearibus teretibus apice pungentibus rigidis crassiusculis juvenilibus microscopice fulvo-sericeis sed cito glabrescentibus; *floribus* 4-meris in spicas abbreviatas paucifloras pubescentes digestis; *calyce* rhachi nequaquam immerso breviter campanulato sparsim minutissime sericeo lobis oblongo-obovatis obtusissimis tubo parum brevioribus marginibus angustis decoloribus; *petalis* —— ; *staminum* fasciculis 4 omnibus inter sese fere æqualibus quoque ligulam late linearem longe exsertam filamenta circa 15 fulcientem ostendenti; *ovario* 3-loculari; *stylo* crassiusculo androecio multo breviore; *fructu* ovoideo basi concavo calycis lobis 2 persistentibus coronato lobis 2 omnino evanidis.

W. Australia, in a rocky creek near West Mt. Barren; *Maxwell*.

Folia pleraque 2–2·5 cm. long., 1 mm. diam. vel paullulum minus, in sicco griseo-viridia necnon longitrorsum rimulosa. Calycis valde coriacei tubus 5 × 5·5 mm.; lobi 4 mm. long. Staminum fasciculi circa 2·5 cm. long.; horum unguis fere 2 cm. long.; antheræ lineari-oblongæ, 2–2·5 mm. long.

Stylus vix 1·5 cm. long. Fructus cinerei, 13 mm. long., 10 mm. diam., loborum 2 persistentum apicibus contiguis.

Affinity clearly with *C. quadrifidus*, Br., and nearest with the terete forms of that species. It is best distinguished by the larger flowers with the calyx-lobes almost as long as the tube, as also by the much larger fruits having the persistent calyx-lobes bent over so as to meet in the middle line, instead of leaving a gap at the top of the fruit.

EUGENIA (§ *Syzygium*) ESSINGTONIANA, sp. nov. Planta glabra; *ramulis* subteretibus cortice brunneo obductis crebro foliosis; *foliis* obovatis vel obovato-oblongis apice late rotundatis basi in petiolum brevem cuneatim angustatis pergamaceis pag. sup. in sicco griseis pag. inf. brunneis; *floribus* parvis in paniculam pedunculatam laxe trichotomam foliis circiter æquilongam dispositis; *pedicellis* calycem circa æquantibus (florum centralium vero brevioribus); *calyce* turbinato ore undulato; *petalis* parvis; *staminibus* numerosis filamentis brevibus crassiusculis antheris subglobosis loculis parallelis dehiscentibus; *stylo* incluso.—*E. Smithii*, Benth., ex parte, non Poir.

Port Essington; *Armstrong.*

Folia plerumque 6–9 cm. long., 3·5–5 cm. lat., opaca, punctis translucentibus haud visis; costa lateralis marginem appropinquans; costæ laterales utrinque circa 40, parum prominulæ; petioli crassiusculi; fusci, 5 mm. long. Panicula 6–7 × 5–6 cm.; hujus pedunculus 2·5–3 cm. long. Pedicelli 2–3 mm., florum centralium 1 mm. long. Ovarium 1 mm. long. calycis pars libera totidem. Petalorum calyptra 2 mm. diam. Filamenta circa 1 mm. long., antheræ ·2 mm. Stylus filiformis, 1 mm. long.

Bentham (Fl. Austral. iii. 283) referred this to *E. Smithii*, Poir., an East Australian species, although it is entirely different in foliage and has not the divaricate anthers he notes as peculiar to that species. It is nearer *E. minutiflora*, F. Muell., described unfortunately without measurements; the obovate or elliptic-cuneate leaves of this are said to be paler below than above, the reverse of what is seen in the case of *E. essingtoniana*, where the underside brown contrasts markedly with the pale grey of the upper face. Moreover, the flowers have very short pedicels; while the statement "fruit rather large, depressed globular," although the specimen of *E. essingtoniana* is in flower only, seems to indicate a difference in the ovary and the fruit.

E. suborbicularis, Benth. This is said by Bentham (*l. c.* 285) to occur only in Queensland, and Mueller (2nd Census) follows him, although Mueller had previously given North Australian localities (Frag. ix. 143). Bentham cites A. Cunningham as having collected this plant on the "N.E. Coast," but Cunningham's material (3rd voy., No. 68) was obtained on the shores of South Goulburn Island. The Banks and Solander specimens Bentham referred to *E. grandis*, Wight, may be noted as really belonging to his *E. suborbicularis.*

E. Armstrongii, Benth. A. Cunningham found this very rare plant (3rd voy., No. 274) at Hunter's River, York Sound (Bentham merely says "N. Coast"). A peculiar feature of the species is that the leaves are often subopposite.

E. Banksii, Britt. & S. Moore, founded on Endeavour River specimens of Banks and Solander, has turned up among Allan Cunningham's plants (3rd voy., No. 67). The locality is given as "very shaded situations in dark woods about the summit of Mount Cook."

MOLLUGINACEÆ.

TRIANTHEMA MAIDENII, sp. nov. *Ramis* procumbentibus ramulos crebro foliosis intervallis brevibus gignentibus uti ramuli foliaque scabriuscule pubescentibus tandem glabrescentibus; *foliis* sessilibus lineari-oblongis vel anguste lineari-oblanceolatis obtusis basi petioliformi-angustatis crassiusculis punctis translucentibus perspicuis pag. utravis gaudientibus; *floribus* solitariis axillaribus pedicellis scabriuscule puberulis quam folia brevioribus insidentibus; bracteis parvulis linearibus; *calycis* scabriuscule pubescentis tubo breviter campanulato lobis ovato-oblongis obtusis quam tubus longioribus; *staminibus* 10–12 margine disci lati irregulariter insertis; *ovario* 2-loculari ovulis quove in loculo 1 placentæ septo adnatæ affixis; stylis 2 crassiusculis.

South Australia, Port Lincoln; *J. H. Maiden.* Ibid., in a hedge by the wayside; *Rev. T. S. Lea.*

Folia pleraque 1·5–2 cm. long., 3–4 mm. lat., exstant vero minora majoraque, saltem in sicco grisea. Pedunculi 5–12 mm. long., bracteæ circa 1·5 mm. Flores flavi. Calycis tubus 1·5 mm., lobi 2·5 mm. long. Filamenta 1 mm. long.; antheræ versatiles, filamentis æquilongæ. Ovarium ovoideum, apice truncatum, 1·25 mm. long., scabriuscule puberulum. Styli 1 mm. long. Capsula in calyce persistenti inclusa, membranacea, 2-loculare, 4 mm. long. Semina diam. 1 mm. paullulum excedentia.

Known on sight from *T. decandra*, DC. by the narrow leaves and the solitary pedicellate flowers.

LOGANIACEÆ.

Mitrasacme is a genus of Loganiaceæ with 28 species according to the 'Index Kewensis,' of which nearly all are confined to Australia, only four being found outside the island continent, from India and South China through Malaya to New Caledonia, and one only of these (*M. setosa*, Hance), a Cambodian plant, not reaching Australia *. It is interesting to note that our genus is closely related to the also almost exclusively Australian *Logania*, the two genera contributing more than 90 per cent. of the Natural Order as represented in Australia. Since vol. iv. of the 'Flora Australiensis' appeared in 1869, only three Australian species seem to have been described, viz. *M. palustris,* Fitzg. and two others by the same author; to these may now be added the two which follow.

Mitrasacme (§ *Mitragyne*) latiflora, sp. nov. Caule pro genere elato gracili sparsim ramoso (ramis ascendentibus) subtereti glabro; *foliis* (radicalibus carentibus) usque ad squamas caulinas minimas ovatas vel subulatas obtusas vel acutas reductis; *floribus* mediocribus in cymam umbelliformem laxe paucifloram digestis; *pedicellis* quam flores longioribus filiformibus uti calyx corollaque glabris; *calycis* campanulati paullo ultra medium indivisi segmentis triangulari-deltoideis obtuse acutis; *corollæ* triente sup. solutæ tubo calycem plus quam duplo excedente late cylindrico faucibus nudo lobis late ovatis obtusis vel obtusissimis; *staminibus* tubo prope basin insertis antheris inclusis; *ovario* ovoideo; *stylo* incluso brevissime bifido.

N. Australia, Palmerston; *Rev. T. S. Lea.*

Planta circa bispithamea. Folia 1–2 mm. long., basi connata. Umbellæ sæpius trifloræ, basi foliorum pari stipatæ. Pedicelli 1–2 cm. long. Calyx circa 3 mm. long.; tubus 1·75 mm., lobi 1·5 mm. long. Corolla alba; tubus 7 × 3 mm.; lobi 3 mm. long. Filamenta circa 4 mm. long; antheræ sagittatæ, obtusæ, 1 mm. long. Ovarium 1·75 mm. long.; stylus dimidio inf. fissus, fere 4 mm. long. Capsula subglobosa, pallida, nitidula, 2·5 mm. diam.

Nearest *M. exserta,* F. Muell., but without, unless they have fallen, the radical leaves, and diverse in calyx and corolla and insertion of stamens.

Mitrasacme (§ *Mitragyne*) nummularia, sp. nov. (Pl. 12. B.) *Herba* annua, pusilla, a basi ramulosa microscopice puberula; *ramulis* filiformibus omnimodo foliosis; *foliis* sessilibus orbiculatis vel saltem late ovatis apice rotundatis vel subito obtuse acutis basi breviter petioliformi-angustatis necnon per paria inter se connatis; *floribus* in axillis solitariis pedunculatis; *calycis* turbinati medium usque divisi segmentis 4 rotundatis acutis apiceque divaricatis; *corollæ* tubo lato calyci circiter æquilongo intus glabro lobis suborbicularibus tubo paullo brevioribus; *staminibus* inclusis corollæ juxta medium tubum insertis filamentis quam antheræ paullulum brevioribus; *ovario* ovoideo in stylum brevem pinguem inferne fissum desinente; stigmate capitato.

Regent's River, N.W. Coast; *A. Cunningham,* 166 (of 4th voyage).

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* From this list *M. lutea,* Lév. (Fedde Rep. iv. p. 331) is excluded, the diagnosis, as is often the case with this writer, being too fragmentary to be of any service.

Herba circa 2 cm. alt. radice subsimplici tenerrima prædita. Folia pleraque 3–5 × 2–4 mm., obscure trinervia, in sicco viridia. Pedunculi 1·5–5 mm. vel etiam fere usque 10 mm. long. Calyx longit. 2 mm. leviter excedens; hujus lobi 1·5 mm. lat. Corollæ tubus 2·5 mm. long.; lobi 1·5 mm. Filamenta ·35 mm. long.; antheræ ovoideæ, obtusissimæ, ·5 mm. long. Ovarium 1 mm., stylus ·3 mm. long.

Affinity with *M. prolifera*, Br., but at once distinguished by the foliage.

This yields a rare instance of a plant of Allan Cunningham's being unrepresented at Kew in the Heward donation; at least success has not attended a search for it there, and it could not have escaped Bentham's eye had the author of 'Flora Australiensis' met with it.

VERBENACEÆ.

Among specially interesting groups of plants native to Australia is the tribe Cloantheæ of the Order Verbenaceæ. Although there is no doubt as to the affinities of this group, the external appearance, usually more or less densely tomentose or woolly, is so peculiar that a botanist, even of some experience, might be forgiven for failure correctly to place its species in the Natural System. Thanks to the good offices of Professor Ewart of Melbourne, the group in question is now fully represented at the Museum except for two or three items. The only unnamed specimen fit to describe is

Dicrastyles Thomasiæ, sp. nov. Suffrutex?; *ramis* saltem sursum bene foliosis dense flavo-villoso-tomentosis; *foliis* sessilibus oblongis obtusis basi rotundatis planis margine crenulatis rugosis utrobique pariter albo-villosulis; *cymis* glomerulum densum globosum referentibus; pedicellis floribus certe brevioribus uti bracteæ maxima pro parte parvulæ necnon calyces dense albo-lanatis; *calycis* segmentis linearibus obtusis fere basin usque inter sese liberis; *corollæ* paullo ultra medium divisæ lobis ovato-oblongis obtusis; *staminibus* breviter exsertis; *ovario* ovoideo villoso; *stylo* biramoso.

West Australia; *Miss Thomas.*

Folia 1·2–1·5 cm. long., 4–5 mm. lat. Florum glomerulus circa 2 cm. diam. Bracteæ perpaucæ exteriores circa 5 mm. long., ceteræ ± 2 mm. Pedicelli summum 1 mm. long., plerique etiam breviores. Calycis segmenta (indumento neglecto) 2 mm. long. Corollæ tubus 1 mm., lobi 1·25 mm. long. Filamentorum pars libera circa 1 mm. long.; antheræ ovoideæ, ·75 mm. long. Ovarium fere 1 mm. Styli rami ·5 mm. long.

The indumentum, flat, oblong leaves and densely headed flowers are the chief features of this species.

PROTEACEÆ.

GREVILLEA (§ *Eu-Grevillea*) EYREANA, sp. nov. Arbor, *ramulis* sat gracilibus subteretibus minute pubescentibus dein glabrescentibus; *foliis* teretibus pinnatisectis segmentis paucis plus minus divaricatis rigidis plerumque semel vel bis 2–3-chotomis ultimis pungenti-acuminatis microscopice puberulis glaucis; *floribus* pedicellatis in racemos plurifloros fulvo-pubescentes foliis circiter æquilongis digestis; *perianthio* extus fulvo-tomentoso basi dilatato segmentis mox solutis superne lineari-oblongis apice anguste ovatis obtusissimis; *toro* obliquo quam ovarium longiore crasso; *glandula* prominente semiannulari tori latere longiori affixa; *ovario* glabro; *stylo* crasso valde curvato minute puberulo; *stigmate* laterali leviter conico.

South Australia, on sandhills in Lake Eyre district (lat. 27° 30′); *Capt. Sturt.*

Folia in toto 5–6 cm. long.; horum basis indivisa 2–2·5 cm. long.; segmenta in toto circa 3 cm. long., ultima ± 1·5 cm., omnia 1 mm. diam. Racemus circiter 5 cm. long. Pedicelli 5 mm. long. Perianthii basis indivisa 3×2·75 mm.; segmenta (inclusa parte apicali 2·5 mm.) 8 mm. long. Glandula fere 2 mm. lat. Tori latus alterum 3 mm., alterum 1·5 mm. long. Ovarium ovoideum 2 mm. long. Stylus 9 mm. long. Stigma 1·5×1·25 mm.

The affinity of this appears to be with *G. Thelemanniana*, Endl., but with too many differential points to require notice. Though without fruit, there can, it would seem, be no doubt as to the genus, since all attempts to find an affinity for it in *Hakea* have met with failure.

G. (§ *Eu-Grevillea*) RUBICUNDA, sp. nov. Fruticosa ? ; *ramis* sat tenuibus quadrangularibus distanter foliosis subtiliter sericeis deinde glabris; *foliis* subsessilibus decurrentibus alte pinnatisectis segmentis 7–14 linearibus apice nigro-mucronatis margine arcte revolutis coriaceis pag. inf. uti rhachis teres sat gracilis subtiliter sericeis pag. sup. glabris; *racemis* simplicibus paniculatisve pluri- ac densifloris tomento denso rubiginoso obductis; *floribus* sessilibus; *perianthii* rubiginose villoso-tomentosi tubo brevi ovoideo segmentis cito solutis superne oblongis apice ovoideis; *toro* recto inconspicuo; *glandula* parva alte lobata; *ovario* sessili villoso; *stylo* valde curvato ipso sub stigmate dilatato villoso; *stigmate* subcirculari levissime convexo.

N. Australia, "Westward of the Gulf [Carpentaria], table-land of the South Alligator"; *Leichardt.*

Foliorum rhachis plerumque 2–3·5 cm. long., 1–1·5 mm. diam., supra late canaliculata; segmenta 5–7 cm. long., 1·5 mm. lat., supra in sicco grisea. Racemi evoluti longit. circa 10 cm. attingentes. Perianthium 7 mm. long. Glandulæ lobi linguiformes, ·5 mm. long. Ovarium 1 mm., stylus 7·5 mm. long. Stigma 1·75×1 mm.

The place of this very distinct species seems to be next *G. chrysodendron*, R. Br., which, among other distinctive features, has much larger- and longer-lobed leaves and pedicelled flowers, besides being without the rubiginous tomentum.

G. (§ *Calothyrsus*) LEICHARDTII, sp. nov. Verisimiliter fruticosa; *ramis* subteretibus crebro foliosis subtilissime sericeis; *foliis* subsessilibus ambitu late ovatis basi latissime truncatis margine utrinque 8–9-lobulatis lobis triangularibus uti folii apex acute mucronatis utrinque perspicue nervosis coriaceis pag. sup. minute pubescentibus pag. inf. appresse fulvo-sericeis; *floribus* secundis in racemos terminales folia facile excedentes plurifloros glabros digestis; *pedicellis* floribus brevioribus; *perianthii* glabri a basi gradatim leviterque amplificati segmentis linearibus apice obovatis; *toro* valde obliquo; *glandula* conspicua semiannulari bilobo; *ovario* stipiti satis elongato imposito glabro; *stylo* compresso sub stigmate laterali ovoideo haud incrassato.—*G. pungens*, Benth. Fl. Austral. v. p. 456 pro parte, non R. Br.

N. Australia, "Sandy scrubland west side of gulf" [Carpentaria]; *Leichardt*.

Folia pleraque 1·5 cm. long., prope basin totidem lat.; horum lobuli inter se inæquales, maxima pro parte 2–4 mm. long., rigidi; petioli 1–1·5 mm. long. Racemus basi nudus, usque ad 7 cm. long. Pedicelli graciles, 3 mm. long. Perianthium in toto 12 mm. long., hujus segmenta 6 mm. long. Glandula 1 mm. alt. Stipes 4·5 mm. long. Ovarium 1 mm., stylus 7 mm. long.

It is difficult to understand how Bentham could have regarded the plant here described as conspecific with *G. pungens*, R. Br., so different in foliage are the two. Brown's plant has leaves several times longer, deeply pinnatisect, and with long linear segments. The flowers of the two are very like, although *G. Leichardtii* has them somewhat larger and broader in the perianth, while its torus is more oblique. Gulliver's Maria Island plant in the Kew herbarium, also referred by Bentham to *G. pungens*, is conspecific with Leichardt's.

DRYANDRA (Series *Obvallatæ*) GILBERTII, sp. nov. Fruticosa; *ramis* sat validis ramulos perbreves foliosos apice floriferos pubescentes deinde glabrescentes emittentibus; *foliis* breviter petiolatis rigide coriaceis ambitu oblanceolatis pinnatifidis lobis 7–12 patentibus triangularibus apice pungentibus paucis inferioribus gradatim imminutis supra glabris nitidisque subtus subtiliter tomentosis; *capitulis* ovoideis foliis arcte stipatis; *involucri* bracteis pluriseriatis lanceolatis (intimis lineari-lanceolatis linearibusve) paucis infimis interdum spinoso-acuminatis ceteris acutis omnibus dorso cinereo- vel fusco-tomentosis; *perianthio* glabro segmentis anguste linearibus fulvo-villosis apice glabris; *stylo* perianthium excedente inferne villoso alibi glabro; *stigmate* obtuso.

W. Australia; *Gilbert*, sine no.

Folia 2·5–5 cm. long., superne summum 1·5 cm. lat., sæpe vero angustiora; lobi majores 6–8 mm. long. Involucra circa 16 × 10 mm. Bracteæ ext. ± 4 mm. long.; intermediæ 6–9 mm., intimæ apice fuscæ, 10–12 mm. long. Perianthii pars primum indivisa 6 mm. long.; segmenta in toto 15 mm. long., pars apicalis anguste fusiformis, 3·5 mm. long. Ovarium 1·5 mm., stylus 22 mm., stigma 2 mm. long.

Undoubtedly conspecific with the above are specimens at Kew collected by Captain Dorrien Smith, one at the Pass in the Stirling Range east of Mt. Toolbrunup, the other on a journey between Bridgetown and Kojonup. These have been named "*Dryandra Purdieana*, Diels, ex descript." But careful scrutiny of the description shows that it relates to a plant with leaves double or almost double as long and broad and with considerably longer lateral lobes, also with heads having broadly ovate outer bracts, though no doubt this is the affinity of the new species.

EUPHORBIACEÆ.

EUPHORBIA (§ *Anisophyllum*) BOULEYI, sp. nov. Planta perennis, crebro ramosa; *ramis* lignosis cicatricibus foliorum delapsorum signatis glabris; *ramulis* tenuibus foliosis minutissime sericeis; *foliis* parvulis oppositis subsessilibus late ovatis vel suborbicularibus basi aliquanto obliquis nonnunquam obscure cordulatis antrorsum minute denticulatis subcoriaceis utrobique uti involucra subtilissime sericeis; *stipulis* maxime exiguis nisi obsoletis; *involucris* parvis in axillis solitariis breviter pedunculatis primo cylindrico-turbinatis postmodo campanulatis; *glandulis* minutis orbicularibus integris vel 1–2-cuspidulatis crassiusculis verisimiliter albis vel saltem pallidissimis; *ovario* triquetro minute sericeo; *stylis* bipartitis; *capsula* minute sericea.

N.W. Coast; *De Bouley*.

Folia 2·5–6 mm. long., 2–5 mm. lat.; petioli summum 1 mm. long. Involucra 1 mm. long.; horum glandulæ ·4 mm. diam. Ovarium fere vel usque ad 1 mm. ex involucro eminens, 1·5 mm. long. Styli rami ·4 mm. long. Semina subevanide rugosa, dilute brunnea, 1 mm. long.

Differs from *E. australis*, Boiss. among other features in the entire absence of villous hairs, the small leaves and involucres, and the greatly reduced fleshy glands. It is nearer *E. Careyi*, F. Muell., of which it has the indumentum, but the leaves are not lanceolate-ovate nor acute, and the involucres and glands are smaller, nor was the narrow membrane surrounding the glands on the outside described for this species to be seen in the present case.

Beyeria cyanescens, Baill. An excellent specimen of this communicated from the Paris Museum, 1816. Grüning (Monogr. p. 74), who gives a poor figure of it, has seen material collected by Naumann on Dirk Hartog

Island, and as many of the Baudin Expedition plants were obtained there, that is most probably the source of the Paris material and not the Recherche Archipelago as Bentham queries (Fl. Austral. vi. p. 67), who, it may be added, never saw the plant.

Bertya oppositifolia, F. Muell. & O'Shanessy. A specimen from Moreton Bay (*Fraser*, 117) would seem to be referable here, though the leaves are longer and narrower than those of the only other Museum specimen, which is from Rockhampton but without the collector's name.

PHYLLANTHUS.

In Robert Brown's Australian herbarium are a considerable number of *Phyllanthus* sheets, for the most part undetermined hitherto at the Museum, and in much the same state at Kew, whither in 1876 a fine set was sent in accordance with the terms of the Bennett bequest. In spite of their having been gathered more than a century ago, several of Brown's plants prove on examination to be still undescribed, an eloquent indication this to the riches one may expect from a thorough examination of tropical Australia. In the immediately following pages this material is dealt with, advantage being taken to notice some rare though already known species of the genus forming part of it. A new species collected by Mr. G. Podenzana (North Queensland, 1891-3), and a Malayan one of the same collector, now first announced as Australian, come also under notice.

Forty-four species referred to six of the forty-four sections proposed by J. Müller for the genus are recognised by Bentham. Baron Mueller some years later (Sec. Cens. Austral. Pl.) added two more, of which one is endemic, and he subsequently described another. Besides these there is one for which Diels is sponsor (Engl. Bot. Jahrb. xxxv. (1904) p. 338), the *P. cuscutæflorus* of the writer, and Fitzgerald's recently published *P. polycladus*. To these the eight following are to be added, making fifty-eight species in all, referable to seven, and if Baron Mueller's identification of a Queensland plant as *P. buxifolius*, Reinw. be correct, to eight sections.

With this comparative abundance of Australian *Phyllanthus* species may be compared the rich representation in New Caledonia, the home of many really handsome species of a genus consisting, for the most part, of plants the reverse of striking in their appearance. Many of these, one imagines, would repay cultivation on account of their beautiful foliage.

Phyllanthus (§ *Synostemon*) **Brunonis**, sp. nov. Suffrutex dioicus; *caule* erecto spithameo (interdum altiore?) ramoso uti rami hispidulo-piloso tandem glabro; *foliis* brevipetiolatis ovatis vel ovato-oblongis obtusis obtusissimisve basi obtusis integris vel obscure denticulatis coriaceis margine

hispidulo-ciliatis necnon leviter revolutis ceteroquin glabris; *stipulis* vix longitudine petiolorum persistentibus linearibus ciliatis; *floribus* utriusque sexus in axillis solitariis pedunculis filiformibus sat longis insidentibus eglandulosis; *floribus* ♂ minutis sepalis inter se æqualibus liberis suborbicularibus hispidule ciliatis staminibus 3 filamentis in columnam brevem connatis antheris longitrorsum dehiscentibus; *floribus* ♀ masculis majoribus sepalis ovatis obtusis nisi obtusissimis hispidule ciliatis ovario depresso stylis basi distinctis alte bipartitis; *capsula* subglobosa late 3-sulcata glabra.

North Coast, Arnhem Bay; *R. Brown*, dist. no. 3611.

Folia magnitudine valde diversa, nunc ± 1 cm., nunc 3 cm. attingentia, in sicco lutescentia, pag. inf. pallida, pag. utravis optime reticulata; petioli 1–3 mm. long. Stipulæ pallidæ, 1–2 mm. long. Pedunculi 3–4 mm. long., ♂ glabri vel fere glabri ♀ hispidule pilosi. Sepala masc. ·4 mm. long., columna staminea ·2 mm. alt.; antheræ columnam stamineam paullulum excedentes. Sepala fem. paullo ultra 1 mm. long., sub capsula usque ad 2·5 mm. aucta. Ovarium vix 1 mm. diam.; styli rami divergentes, ·5 mm. long.

To be placed close to *P. ditassoides*, Muell. Arg.: a very distinct species on account of its foliage together with the flowers with broad hispidulous sepals.

PHYLLANTHUS PODENZANÆ, sp. nov. Suffrutex e rhizomate sat valido caules simplices ramososve emittente; *ramis* bene foliosis aliquanto debilibus angulosis superne compressis microscopice puberulis; *foliis* breviter petiolatis late ovatis vel suborbicularibus (ultimis ovato-oblongis) apice rotundatis ipso interdum mucronulatis basi rotundatis vel rotundato-truncatis nequaquam cordatis margine cartilagineis in sicco brunnescentibus firme membranaceis pag. inf. microscopice puberulis; *stipulis* lineari-lanceolatis acuminatis mox plus minus patentibus; *floribus* ♂ ignotis; floribus ♀ axillaribus solitariis pedunculatis; *sepalis* liberis erectis oblongis (uno anne semper? oblongo-ovato) obtusis dorso carinulatis membranaceis glabris; *glandulis* nullis; *ovario* ovoideo glabro; *stylis* basi leviter divergentibus integris.

Queensland, Cooktown; *Podenzana*.

Folia majora 2–3·5 × 1·5–2·5 cm., mediocria ± 15 × 13 mm., minima in ramis ulterioribus usque ad 6–10 × 4–5 mm. reducta; costæ laterales ut reticulum inconspicuæ; petioli 1–2·5 mm. long. Stipulæ dilute brunneæ, 1·5 mm. long. Pedunculi 3–4 mm. long., glabri. Sepala alba, ægre 5 mm. long. Ovarium 1 mm. long., basi totidem diam.; styli revoluti apice truncati, vix 1 mm. long.

This most probably belongs to § *Synostemon*, but in the absence of male flowers the point must remain undecided. At first sight it suggests *P. ditassoides*, Muell. Arg., but the indumentum is different, the brown-drying leaves are not cordate, the glabrous sepals are somewhat longer and not coriaceous, the ovoid (not depressed-globular) ovary is glabrous, and the styles are simple and very slightly divergent.

P. Adami, Muell. Arg. N. Australia, Groote Eylandt; *R. Brown*, dist. no. 3608.

PHYLLANTHUS (§ *Synostemon*) ARNHEMICUS, sp. nov. Suffrutex dioicus fere trispithameus crebro ramosus glaber; *ramis* e collo sat robusto filiformibus distanter foliosis ramulos ascendentes graciles foventibus angulatis striatis; *foliis* parvis sessilibus linearibus obtusis acutisve; *stipulis* pusillis anguste linearibus mox delapsis; *floribus* pedunculatis glandulosis; *floribus* ♂ in fasciculos 2–3-floros sæpissime ordinatis sepalis liberis patentibus obovato-oblongis obtusissimis staminibus 3 filamentis in columnam brevem sepalis breviorem connatis antheris cohærentibus in longitudinem dehiscentibus; *floribus* ♀ quam masculi majoribus solitariis sepalis oblongis obtusis; *ovario* late obovoideo apice truncato glabro; *stylis* a basi divergentibus bipartitis ramis divaricatis; *capsula* hucusque vix matura ovoidea glabra.

N. Australia, Arnhem Bay; *R. Brown*, dist. no. 3597.

Folia longit. raro 10 mm. attingentia, sæpius 5–8 mm., summum 1 mm. lat. vel paullulum ultra. Flores ♂—sepala ·4 mm. long., columna staminea ·25 mm. alt., antheræ ·2 mm. long. Flores ♀ 3 mm. diam., sepala ægre 1·5 mm. long., sub fructu 2 mm., ovarium ·6 mm. long. superne 1 mm. lat., styli ·6 mm. long. Capsula 3 × 3 mm.

Apparently nearest *P. Adami*, Muell. Arg., but with several discrepancies in the leaves and flowers.

PHYLLANTHUS (§ *Synostemon*) LISSOCARPUS, sp. nov. Suffrutex monoicus copiose ramosus glaber; *ramis* ascendentibus gracilibus satis crebro foliosis; *foliis* breviter petiolatis linearibus apice acute mucronulatis rigidiusculis; *stipulis* exiguis filiformibus erectis diutule persistentibus; *floribus* eglandulosis utriusque sexus breviter pedunculatis, ♂ sepalis patentibus obovato-oblongis obtusis, staminibus 3 filamentis in columnam connatis antheris omnino liberis loculis in longitudinem dehiscentibus; *florum* ♀ sepalis masculis similibus ovario turbinato apice truncato glabro; *stylis* abbreviatis distantibus pinguibus bifidis.

N. Australia, Groote Eylandt; *R. Brown*, dist. no. 3606.

Folia pleraque 6–12 mm. long. raro 2 mm. lat., sæpissime ·5–1 mm. Stipulæ ægre 1 mm. long. Pedunculi ♂ 1·5 mm., ♀ vix totidem. Flores ♂ diam. 2 mm. paullulum excedentes. Columna staminea antheris parum longior, ·5 mm. long. Ovarium ·65 mm., styli ·4 mm. long., illud apice 1 mm. diam.

Differs from *P. rhytidospermus*, F. Muell. in the narrow leaves, the small erect stipules a marked difference from that species, the longer staminal column with quite free anthers, and the broader female perianth-segments.

PHYLLANTHUS (§ *Paraphyllanthus*) EUTAXIOIDES, sp. nov. Suffrutex monoicus?, parvus, glaber; *ramis* e collo sat robusto ascendentibus simplicibus vel subsimplicibus crebro foliosis; *foliis* subsessilibus laxe imbricatis lineari-oblongis obtusis subcoriaceis; *stipulis* fugaceis; *floribus* ♂ in axillis solitariis pedunculis gracilibus quam sese paullo longioribus suffultis; *sepalis* liberis ascendentibus oblongis obtusis marginibus albis; *glandulis* 6 globulosis perspicuis; *staminibus* 3 filamentis in columnam pinguem conferruminatis antheris columnæ vix æquilongis connatis in longitudinem dehiscentibus; *floribus* ♀ quam ♂ longius pedunculatis; *sepalis* quam illa fl. ♂ majoribus oblongis obtusis sub fructu solummodo obviis; *capsula* haud visa.

East Coast (Queensland?); *R. Brown*, dist. no. 3617.

Folia ± 1 cm. long., in sicco grisea, costa media conspicua percursa. Pedunculi ♂ circa 2·5 mm. long., sub flore paullulum incrassati. Sepala vix 2 mm. long. Columna staminea ·5 mm. alt. et lat.; antheræ ·4 mm. long. Pedunculi ♀ saltem sub fructu fere 1 cm. long. Sepala 3·5 mm. long. Capsula floris unici visi jam delapsa.

Near *P. maderaspatanus*, L., but the leaves and flowers are distinct in several particulars. The general appearance is much that of *Eutaxia myrtifolia*, R. Br.

PHYLLANTHUS PUSILLIFOLIUS, sp. nov. Suffrutex copiose ramosus, glaber; *ramis* divaricatis rigidis sparsim foliosis; *foliis* subsessilibus ramulis brevissimis insidentibus exiguis obovatis vel suborbicularibus obtusis vel obtusissimis; *stipulis* minimis haud persistentibus; *floribus* ♂ ignotis; *floribus* ♀ parvulis ex axillis solitatim ortis pedunculis filiformibus elongatis fultis; *sepalis* liberis æqualibus ovatis obtussissimis nervo medio conspicuo percursis; *glandulis* in discum 6-lobulatum concretis; *ovario* subgloboso glabro; *stylis* divaricatis alte bipartitis.

Queensland, Broad Sound; *R. Brown*, dist. no. 3601.

Folia 1·5–3 mm. long., 1·5–2 mm. lat., in sicco fusca. Pedunculi usque 10 mm. long., sæpius vero circa 7–8 mm. Flores 2 mm. diam. Sepala 1 × ·6 mm. Ovarium ·35 × ·4 mm. Styli ægre ·5 mm. long.

With its copious rigid branching and extremely small leaves, together with the gland-bearing flowers, this is very distinct from any known Australian species. In the absence of male flowers, however, the affinity cannot be stated, but the neighbourhood of *P. Mitchelli*, Benth. may be suggested for its true position.

PHYLLANTHUS (§ *Eu-Phyllanthus*) EBORACENSIS, sp. nov. Planta glabra, *caule* tenui lignescente inferne nudo superne ramulos filiformes foliosos gerente; *foliis* subsessilibus ovatis apice rotundatis ipso microscopice mucronulatis basi obtusissimis membranaceis supra læte viridibus subtus glaucis; *stipulis* parvulis lineari-lanceolatis acuminatis scariosis brunneis diutule persistentibus: *floribus* ♂ solum visis exiguis in fasciculos paucifloros bracteis scariosis stipulis similibus stipatos digestis pedicellis brevibus filiformibus insidentibus; *sepalis* inter se liberis obovatis apice rotundatis; *glandulis* 6 bene evolutis ovatis obtusis; *staminibus* 3 filamentis brevissimis liberis antheris subglobosis transversim dehiscentibus.

Cape York; *Daemel.*

Caulis 26 cm. alt., uti ramuli rubro-brunneus. Folia summum 10 × 6·5 mm., pleraque ± 6 × 4·5 mm.; petioli summum vix 1 mm. long. Stipulæ ·75 mm. long. Pedicelli ægre 1 mm. long. Flores 1·25 mm. diam. Sepala ·5 mm. long. Antheræ ·2 mm. diam.

Nearest *P. simplex,* Retz., which is entirely different in foliage and has larger male flowers with larger glands and stamens, the latter with longer filaments.

PHYLLANTHUS (§ *Eu-Phyllanthus*) LEAI, sp. nov. Planta spithamea vel semispithamea omnimodo glabra; *caule* sinuoso-ascendente ramulos filiformes foliosos hac atque illac emittente; *foliis* subsessilibus oblongis vel anguste oblongo-obovatis obtusis vel obtussissimis basi obtusis membranaceis; *stipulis* lineari-lanceolatis acuminatis decoloribus diutule persistentibus; *floribus* in axillis plerumque solitariis vel binis breviter pedicellatis bracteis scariosis stipatis; *floribus* ♂ sepalis obovatis apice rotundatis uti sepala ♀ linea perspicua percursis glandulis pusillis subglobosis staminibus 3 filamentis in columnam brevem connatis antheris subglobosis connatis transversim dehiscentibus; *floribus* ♀ quam ♂ majoribus glandulis bene evolutis ovatis membranaceis ovario subgloboso trisulco stigmatis ramis brevibus a basi divergentibus bifidis,

N. Australia, Palmerston; *Rev. T. S. Lea.*

Folia pleraque 12–17 mm. long., 4–6 mm. lat., in sicco griseo-viridia. Stipulæ circa 1 mm. long. Pedicelli ♂ ·5 mm. ♀ 1 mm. long., hi superne incrassati. Flores ♂ 1·2 mm. diam.; sepala ·4 mm. long.; antheræ 0·15 mm. lat. Flores ♀ 2 mm. diam.; sepala ægre 1 mm. long.; ovarium ·5 mm. diam. Capsula hucusque vix matura glabra, 2 mm. diam.

This is also near *P. simplex,* Retz. Among its peculiarities may be mentioned the broader leaves, the short pedicels, and the united filaments and anthers.

P. lamprophyllus, Muell. Arg. Queensland, Barrow River and Myola; *Podenzana.* Sandy Cape and Port Bowen; *Macgillivray,* 62. A note by Major Gage in the Kew Herbarium led to this identification. The Kew

specimen is incomplete, being without flowers, and this rendered certain naming impossible. As there are both ♂ and ♀ flowers on the Museum specimens, there is now no doubt that this Malayan species extends to Australia. It should be expected from North Australia too. It may be added that a new section (*Emblicastrum*) of the genus now makes its appearance in the Australian flora.

PETALOSTIGMA HUMILE, W. V. Fitzg. (ex descript.). N. Australia, Palmerston; *Rev. T. S. Lea.*

Female flowers not seen, but male specimens agree well with the recently published description in Journ. and Proc. R. Soc. W. Australia, iii. p. 62. Mr. Lea's note runs—"Shrub springing in burnt ground, flowers yellow."

New to the Northern territory, though the original locality, King River, is not far from its western border.

TRITAXIS AUSTRALIENSIS, sp. nov. Planta fere omnino glabra; *ramulis* foliosis cortice brunneo-griseolo lenticellifero obductis; *foliis* petiolatis late ellipticis apice basique obtusis margine repandis vel integris opacis subtus pallidioribus costis lateralibus utrinque 8–10 pag. utraque facile aspectabilibus; *floribus* masculis solummodo obviis in cymas breves pedunculatas laxe trichotomas digestis; *pedicellis* filiformibus calycem certe excedentibus; *calycis* minutissime fulvo-sericei lobis oblongo-ovatis obtusissimis quam petala ovata obtusissima quasiunguiculata brevioribus; *disci* glandulis 5 subglobosis; *staminibus* 5 ad medium columnæ insertis additis 2–4 columnam coronantibus.

Queensland, Cape York; *Daemel.*

Folia (lamina sola) sæpius 10–15 cm. long., 5–6·5 cm. lat., exstant vero minora, glandulis minutis translucentibus creberrime instructa; reticulum sat apertum, pag. utravis visibile; petioli 6–15 mm. long., basi sæpe aliquantulum dilatati necnon transversim rugulosi. Stipulæ fugaceæ, lanceolatæ, 1·5 mm. long. Cymæ 3–4 × 3–6 cm. Pedunculus 6–12 mm. long. Bracteæ pusillæ, lanceolatæ, circa 1 mm. long. Pedicelli plerumque 5–7 mm. long. Flores pansi circa 8 mm. diam. Calycis tubus 1 mm., lobi 2 mm. long. Petala 5 mm. long. Columna staminea sub verticillo crassiuscula, fere 3 mm. long., superne tenuis et 2 mm. long.; filamenta libera 1·5 mm. long.; antheræ ovideæ, obtusæ, fere 1 mm. long.

An addition to a small genus of three species, native respectively to India, Cochin China, and the Philippines, and hitherto not reported from Australia. Its occurrence in New Guinea may therefore be expected. One may mention that the 3-fid calyx given for this genus in 'Genera Plantarum' (iii. pt. 1. p. 292) is a mistake, most likely of the printer: this error Pax copies in 'Nat. Pflanzenfam.' iii. 5. p. 74, but he is more careful and gives the

proper number (5) of calyx-segments in his monograph in 'Das Pflanzenreich' (iv. 147. p. 113).

CROTON (§ *Eu-Croton*) ARMSTRONGII, sp. nov. *Ramis* verisimiliter erectis satis gracilibus pubescentibus ramulos pseudoverticillatos foliosos tenues pubescentes sursum emittentibus; *foliis* ramorum sub ramulis pseudoverticillatis quam ea ramulorum multo majoribus omnibus ovato-oblongis acutis basi obtusis nisi truncato-rotundatis margine dentatis (minoribus fere vel omnino integris) 5-nervibus pag. sup. pilis stellatis sparsim inspersis pag. inf. stellato-pubescentibus majoribus manifeste minoribus breviter petiolatis summis vero subsessilibus; *racemis* folia superantibus tandem subdistanter plurifloris pubescentibus; *floribus* inf. ♀ sup. ♂ omnibus breviter pedicellatis; *sepalis* ♂ oblongo-ovatis obtusis extus pubescentibus petalis glabris conformibus; *staminibus* 10 (anne semper ?); *sepalis* ♀ quam ♂ majoribus ovato-oblongis obtusis extus tomentellis; *ovario* dense tomentoso; *stylis* dichotome 5–7-partitis.

Port Essington; *Armstrong.*

Folia membranacea, in sicco viridia, majora usque 5 cm. long., prope basin 2 cm. apicem versus 1 cm. lat.; petioli 5–10 mm. long.; folia minora ± 1·5 cm. long., horum petioli summum 3 mm. long. Racemi rite evoluti 5·5–7 mm. long. Bracteæ cymbiformes, circa 1 mm. long. Pedicelli utriusque sexus 1–1·5 mm. long. Sepala et petala ♂ circa 2 mm. long. Sepala ♀ 3 mm. long. Styli ramuli apice incurvi, circa 1·5 mm. long.

A very distinct species easily separable from *C. Verreauxii*, Baill. by the slender habit, small leaves, male flowers with glabrous petals, and the many-branched styles.

CODIÆUM MEMBRANACEUM, sp. nov. *Foliis* obovato-oblongis obtusis nonnunquam apice breviter cuspidato-attenuatis basin versus gradatim in petiolum sat longum attenuatis basi brevissime cordatis membranaceis glabris; *racemo* ♂ solummodo obvio subterminali folia breviter excedente distanter florifero minute puberulo; *floribus* parvis plerumque binis pedicellis filiformibus minute puberulis sese longe excedentibus fultis; *sepalis* suborbicularibus ægre omnino glabris; *petalis* ?; *disci* glandulis suborbicularibus crassiusculis, staminibus fere 40.

Queensland, Cape York; *Daemel.*

Folia 13–16 cm. long., apicem versus 5·5 cm. lat., infra medium 3·5–4 cm. lat. ima basi tantum 3–4 mm., in sicco læte viridia; petioli 3–4 cm. long. Racemus fere 20 cm. long. Pedicelli sub florendi tempore 8 mm. long. Sepala 1·65 mm. diam. Filamenta circa 2 mm. long.; antheræ ·5 mm. lat.

Bentham (Fl. Austral. vi. p. 147) gives "about 20" stamens to the flowers of *C. variegatum*, Blume, var. *moluccanum*, Muell. Arg., hitherto the only

known Australian representative of the genus: in the 'Genera Plantarum' (iii. pt. 1. p. 299) the number of stamens for the genus is said to be 15–30. The plant under notice has certainly more stamens, but in view of this character's doubtful value and the female flowers being unknown, the claim of the present plant to specific rank must rest upon the membranaceous (not coriaceous) leaves markedly broader in their upper half and the small male flowers. If the petals be really absent that would be another peculiarity.

EXPLANATION OF THE PLATES.

Plate 11.

A. Fruits of *Tribulus.*

1. *Tribulus Hystrix,* R. Br., with long subulate spines. 2. *Tribulus occidentalis,* R. Br., showing smaller fruit with short spines; both nat. size.

B. *Leptospermopsis myrtifolia,* gen. et sp. nov.

1. The plant, nat. size. 2. A flower, × 6. 3. Section of same, the petals and stamens removed.

C. *Calothamnus validus,* sp. nov.

1. The plant, nat. size. 2. Fruit in side view, × $\frac{3}{2}$.

Plate 12.

A. *Symphiobasis alsinoides,* sp. nov.

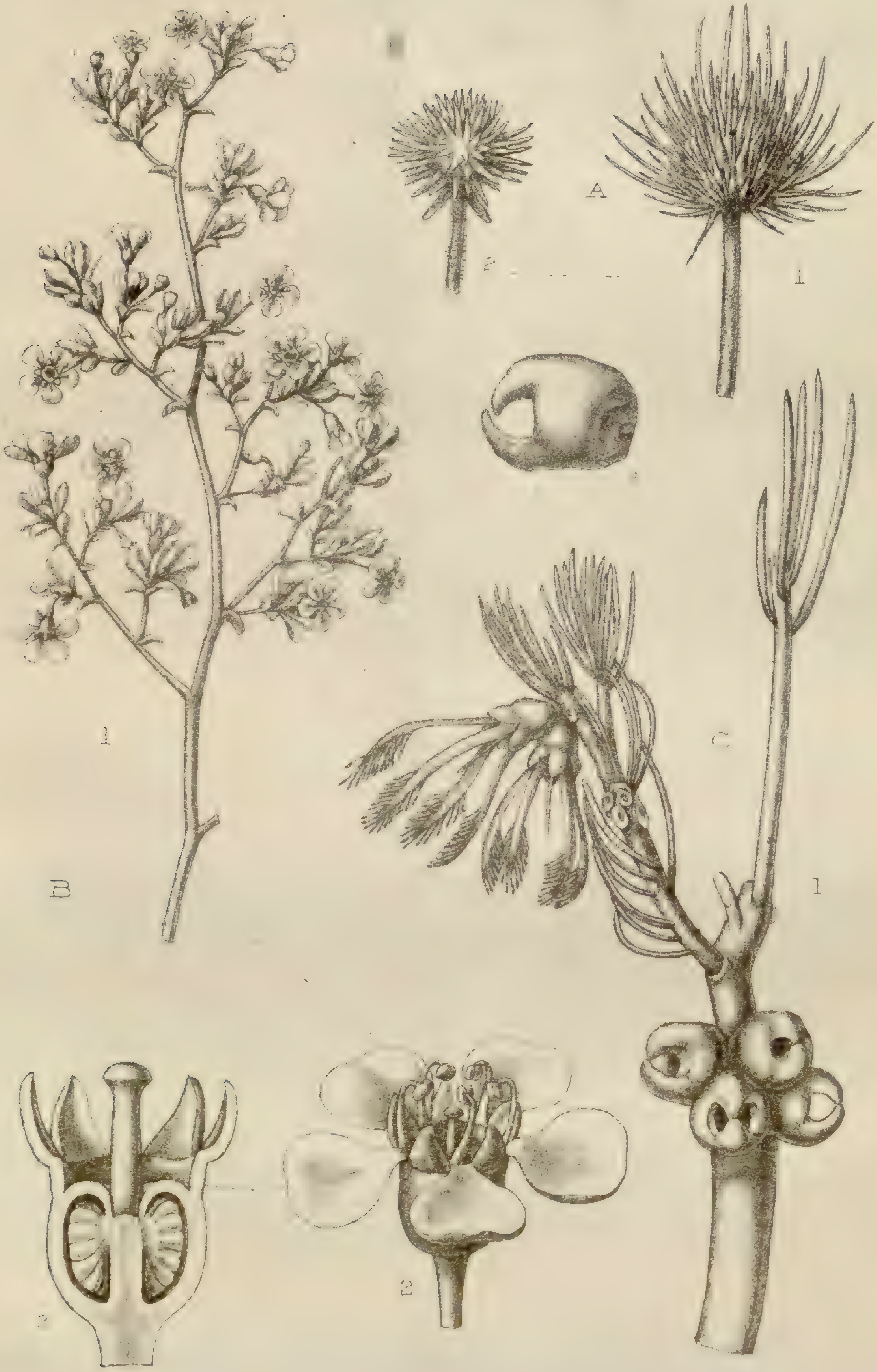
1. The plant, nat. size. 2. A flower, × 10, after three of the calyx segments have been removed, showing the corolla (*c*) adnate below to the ovary and also its spur (*sp.*). 3. Andrœcium with the style and stigma, × 16.

B. *Mitrasacme nummularia,* sp. nov.

1. The plant, nat. size. 2. Flowers in various stages, × 10. 3. Young flower viewed from above, × 10. 4. Corolla opened, showing the stamens, × 10. 5. Calyx slit open to show the ovary, × 10. 6. Ovary in transverse section, magnified.

Moore

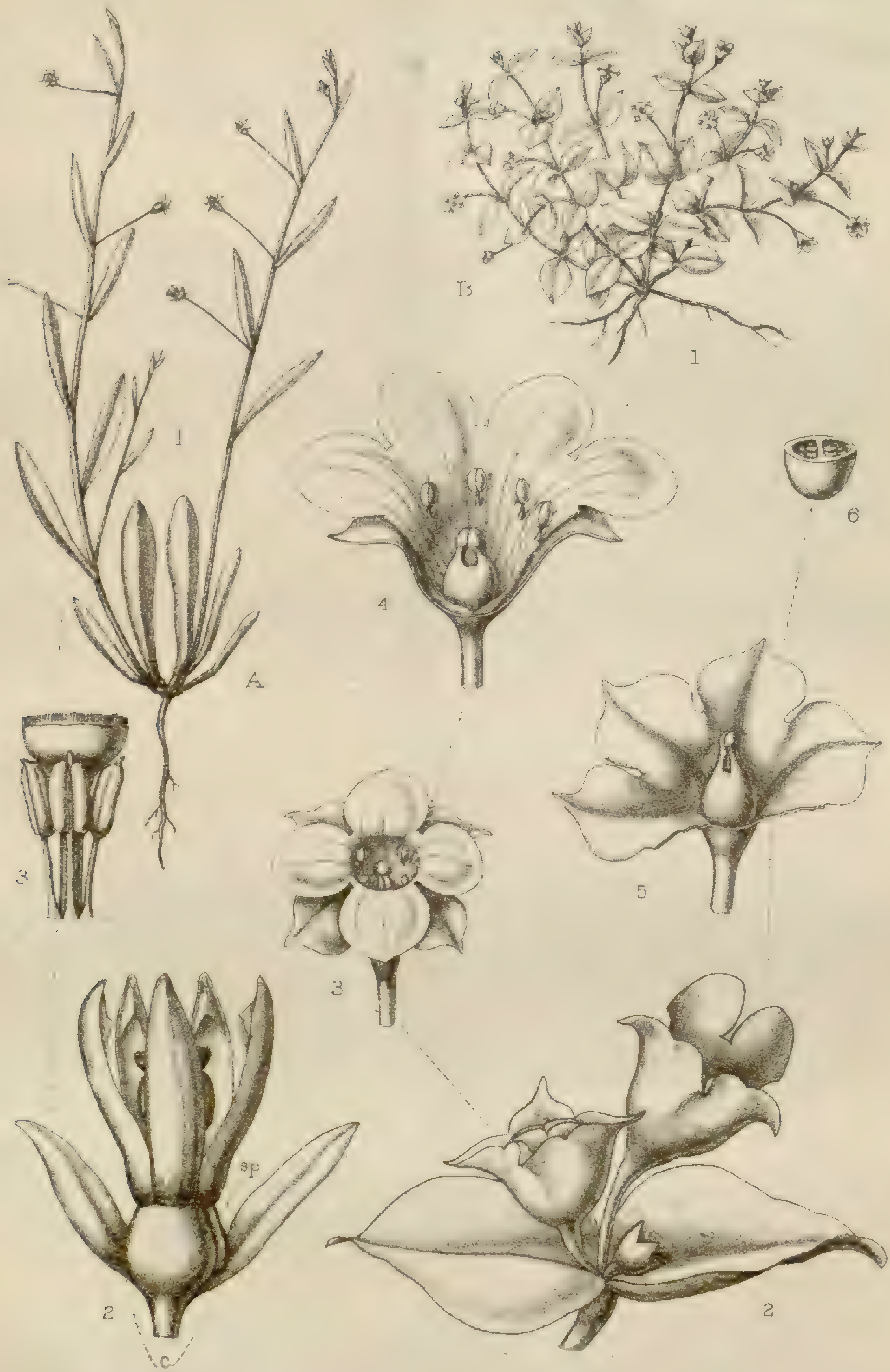
JOURN. LINN. SOC. BOT. VOL. XLV. PL. 11



P.Highley del.et lith.

C.Hodges & Son imp.

AUSTRALIAN PLANTS


1
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P. Highley del et lith.
C. Hodges & Son imp.

AUSTRALIAN PLANTS

A Revision of the Genus *Baphia*, DC. (Leguminosæ).

By L. V. LESTER-GARLAND, M.A., F.L.S.

[Read 6th November, 1919.]

THE following paper is the result of a study of the rich material contained in the Herbaria of the British Museum and the Royal Gardens, Kew, and I am much indebted to the authorities of both those institutions for much kind help which has facilitated the work. A very large proportion of the species were represented in one or other, or both, of those collections, and Professor Diels of Berlin and Professor De Wildeman of Brussels have very kindly lent or presented types of those which we did not already possess in this country, for which I tender them my grateful acknowledgments. I have thus been enabled to see authentic types of all the species except two, but the material in one or two cases was rather scanty, as was inevitable.

The number of species has increased greatly in recent years, as has been the case with many other tropical African genera. In the 'Genera Plantarum' the number of species is given as 6. In Oliver's 'Flora of Tropical Africa' (1871) 10 species are described. In Dalla Torre and Harms' 'Genera Siphonogamarum' the number has risen to 30, and in Thonner's 'Flowering Plants of Africa' to 50. In the present paper 58 species are enumerated, excluding synonyms and varieties. Three species (*B. Mildbraedii* Harms, *B. ovata* T. R. Sim, and *B. Pynaertii* De Wild.) have been reduced, and it is possible that if more materials were available, one or two others would have to share the same fate, but at present it seems best to leave them. On the other hand, there are three new species and one new variety.

In the case of the older and better-known species it seemed unnecessary to quote more than one or two collectors' names and numbers for each district, but in the case of the more recently described or doubtful species the quotations have been made as full as possible.

The genus *Baphia*, commonly ascribed to Afzelius, really dates from De Candolle, Prodr. ii. p. 424 (1825), where it appears to have been first diagnosed. In 1819 Loddiges (Bot. Cab., Plate 367) had described a *species*, *B. nitida*, founded on a plant originally brought by Dr. Afzelius from Sierra Leone, which Loddiges had had in cultivation for ten years, but he gave no diagnosis of the *genus*. In 1826, Desvaux (Ann. Sci. Nat. ser. 1, ix. p. 406) established the genus *Delaria*, which included two species—*D. ovalifolia* from Brazil, which was not a *Baphia*, and *D. pyrifolia* from Upper Guinea, which was simply another form of *B. nitida*, though wrongly identified with *B. polygalacea* Baker in the Flora of Trop. Africa, and also by Baillon in Bull. Soc. Linn. de Paris, i. p. 445 (1884), and by Harms in

Pflanzenfam. Nachtr. i. 1897, p. 200. This is a surprising mistake, for *B. polygalacea* is not a *Delaria* at all, but a *Bracteolaria*. In 1841, Hochstetter (Flora, xxiv. p. 658) published his genus *Bracteolaria*, founded on *B. racemosa* from Natal. *Bracteolaria* seems to have been first reduced to a section of *Baphia* in Walp. Ann. vii. p. 801 (1868). The arrangement now generally accepted by which *Bracteolaria* and *Delaria* are ranked as the two component sections of the genus *Baphia*, dates from Bentham and Hooker, Gen. Plant. i. p. 553 (1875). It may be remarked, however, that *B. nitida* is there erroneously referred to the section *Bracteolaria*, and that the sectional distinction drawn from the colour of the flowers (white in *Bracteolaria*, yellow in *Delaria*) does not hold for all the species now known.

The primary division of the genus is based upon the different methods of rupture of the calyx, which before the flowers open forms a sort of calyptra completely enclosing the petals. In *Bracteolaria* it becomes 2-cleft, almost bilabiate, and no subdivision is necessary as the section only includes 12 species. In *Delaria*, to which the bulk of the species belong, the calyx splits up one side and forms a sort of spathe. Here it becomes necessary to subdivide. Harms (Pflanzenfam. Nachtr. i. p. 200) took the inflorescence as his test, and established two subdivisions—(a) *Genuinæ*, with flowers 1 to 5 in the axils of the leaves, which he further subdivided according to the shape and size of the bracteoles; and (b) *Racemiferæ*, with flowers in axillary racemes or panicles. This is not altogether satisfactory, owing to the confused character of the inflorescence in some species; and I have substituted an arrangement based on the bracteoles, which has the advantage of giving prominence to a small but very distinct group of species, the *Striatæ*, and seems to me to be on the whole more workable and to throw the species into more natural groups. For further subdivision I have relied a good deal upon the character of the indumentum of the petioles and inflorescence.

A third section of the genus, *Macrobaphia*, was suggested by Harms in Engl. Jahrb. xl. p. 35 (1908) for his new species, *B. macrocalyx*—"calyx apice distincte 5-dentatus, dentibus majusculis, sub anthesi spathaceo-fissus." But this character is obviously of very inferior importance to those used to differentiate the two older sections. Moreover, the division of the calyx-teeth is often clearly observable in some other species—indeed, it is a conspicuous feature in Desvaux's original plate of *Delaria pyrifolia*.

Baphia is mainly a tropical African genus. The extreme limits of its distribution are from Lat. 9° N. (*B. Heudelotiana* in Southern Senegambia) to Lat. 30° S. (*B. racemosa* in Natal), and from Long. 13° W. (Senegambia) to Long. 115° E. (*B. borneensis* in North Borneo). The species which lie outside the main area are *B. racemosa* in Natal (the only species outside the tropics), *B. capparidifolia* in Northern Madagascar, and *B. borneensis* in Borneo. The occurrence of the last at so great a distance from the continent of Africa is a remarkable fact of distribution; and it is noteworthy that this isolated species is not an exceptional or aberrant type, but closely related to the West African *B. spathacea*, from which it is separated by the whole width of Africa and at least sixty degrees of longitude of ocean.

Descriptive Key to the Species.

Section 1. BRACTEOLARIA. Calyx 2-fid.

- Indumentum of petioles and inflorescence rather thin and greyish.
  - Leaves narrowing gradually to the point, comparatively short-petioled.
    - Leaves lanceolate, membranous, more or less cuneate at the base, crowded, 4 to 7 cm. .... 1. *B. racemosa.*
    - Leaves lanceolate, sub-coriaceous, rounded at the base, 5 to 7 cm. Indumentum rather thick .... 2. *B. capparidifolia.*
    - Leaves oblong-lanceolate to ovate-oblong, more or less cuneate, membranous, 7 to 15 cm. Racemes very short, pedicels capillary .... 3. *B. Radcliffei.*
  - Leaves variable, broadly lanceolate to ovate, always more or less cuspidate, rounded or sub-cordate at the base, long-petioled .... 4. *B. polygalacea.*
  - Leaves with rather conspicuous parallel nerves (8–10) and short petioles. Racemes short (2·5 cm.). Pods linear, velvety .... 5. *B. Laurentii.*
- Indumentum dense and harsh; leaves shortly petioled, hardly cuspidate; inflorescence ample .... 6. *B. multiflora.*
- Indumentum dense and velvety.
  - Petals twice as long as calyx; leaves ovate-lanceolate up to 10 cm., membranous. Racemes 10 cm. .... 7. *B. Heudelotiana.*
  - Petals not twice as long as calyx.
    - Leaves oval, with a cordate base, rounded or with a short point, 4 to 8 cm. by 3 to 5. Racemes 1·5 to 3 cm. .... 8. *B. bangweolensis.*
    - Leaves oblong, 3 to 4 cm. Racemes 2 to 5 cm. Inflorescence and leaves with dense, yellow, villous hairs .... 9. *B. aurivellerea.*
    - Leaves lanceolate, rounded or sub-cordate at the base, long-petioled, sub-coriaceous, 4 to 7 cm. Racemes 3 cm. .... 10. *B. Zenkeri.*
    - As *B. Zenkeri*, but racemes longer and petioles shorter .... 11. *B. Lescrauwaetii.*

Section 2. DELARIA. Calyx spathaceous.

A. MICROBRACTEOLATÆ. Bracteoles very small, often minute, reniform, sub-orbicular or broadly ovate; velvety or glabrous. (Oblong or linear oblong in some forms of *B. leptobotrys* and in *B. silvatica*.)

- 1. Glabrous or glabrescent trees or shrubs.
  - i. Flowers 1–5 in the axils of the leaves.
    - (*a*) Ovary glabrous.
      - (*α*) Petals twice as long as the calyx. Pedicels slender, shorter than the petioles, up to 10 mm. Leaves variable, 6 to 15 cm. Flowers solitary or in pairs .... 12. *B. nitida.*

(β) Petals not twice as long as the calyx. Leaves mostly smaller, 6–9 cm.

Pedicels capillary, up to 2·5 cm., 4 to 6 times as long as the petioles. Leaves broadest at the base, gradually cuspidate .... 13. *B. angolensis.*

Pedicels as above, leaves broadest at or above the middle, abruptly cuspidate with short points. Buds small .... 14. *B. gracilipes.*

As *B. gracilipes*, but leaf-points up to 2·5 cm. .... 15. *B. Conraui.*

Near *B. gracilipes*, but pedicels shorter and leaves oblong-lanceolate .... 16. *B. Preussii.*

Pedicels thicker and shorter (1–1·3 cm.), pubescent at the top. Flowers up to 2 cm. Leaves dark green, sub-coriaceous .... 17. *B. Wollastoni.*

(*b*) Ovary shortly but densely pubescent. Pedicels long and slender. Leaves sub-coriaceous........... 18. *B. bipindensis.*

ii. Flowers in more or less elongated axillary racemes.

(*a*) Racemes slender, 3–13 cm. The whole plant glabrous with the exception of the ovary.

Racemes 5–7 cm. Leaves long-petioled (2–3 cm.), long-pointed, membranous (sub-coriaceous in var. *nigerica*). Ovary densely hirsute. Bracteoles oblong .... 19. *B. leptobotrys.*

Racemes 3–5 cm. Leaves short-petioled (5–8 mm.), with shorter cusps, papyraceous. Ovary with short adpressed hairs. Bracteoles almost reniform .... 20. *B. hylophila.*

Racemes 7–13 cm. or longer. Petioles 1–2·5 cm. Bracteoles rather large (3–4 mm.), oblong or narrowly oblong, glabrous, striated. Flowers larger .... 21. *B. silvatica.*

(*b*) Flowers in lax, fasciculate racemes from the old stems. Leaves much as in *hylophila.* Ovary glabrous .... 22. *B. obanensis.*

(*c*) Racemes only 1–2 cm. Petioles 4–6 mm. Bracteoles minute, squamiform, sub-orbicular.

Ovary glabrous, as are the pedicels and calyx. Axis of the inflorescence densely hairy .... 23. *B. brachybotrys.*

Ovary hirsute; axis glabrous or glabrescent ...... 24. *B. Buettneri.*

2. Inflorescence, or part of it, densely velvety. The petioles and young twigs are often hairy as well.

i. Flowers solitary or sub-solitary. Leaves narrow, glabrous, sub-coriaceous.

Ovary glabrous.................................. 25. *B. Nannani.*

Ovary hairy .... 26. *B. acuminata.*

ii. Flowers 2–5 in the axils of the leaves.

(*a*) Calyx glabrous, except at the tip. Ovary glabrous. Leaves soft in texture. Pedicels, young branches, petioles, and nerves of leaves all more or less hairy.. 27. *B. barombiensis.*

(*b*) Calyx glabrous or glabrescent. Ovary brown-velvety.

Calyx glabrous or nearly so. Bracteoles squamiform, sub-orbicular. Pedicels velvety. Leaves coriaceous, glabrous, with thick, short petioles (5–10 mm.) .... 28. *B. crassifolia.*

Calyx glabrescent below, ± hairy in the upper part. Bracteoles larger. Pedicels velvety or pilose. Leaves sub-coriaceous .... 29. *B. densiflora.*

Calyx as in *densiflora.* Pedicels long, slender, strict, densely pubescent when young, becoming glabrate later. Leaves glistening above, brown-punctulate below .... 30. *B. myrtifolia.*

(*c*) Calyx, ovary, and pedicels all velvety or pilose.

1. Calyx and pedicels with dense whitish indumentum. Ovary densely hirsute. Leaves very short-petioled, oblanceolate-oblong, rather abruptly cuspidate.... 31. *B. eriocalyx.*

2. Calyx and pedicels ferrugineous-pubescent. Ovary pubescent. Bracteoles very small.

Young branches and under surface of young leaves densely silky. Ovary pubescent. Pedicels 7–10 mm. Calyx 6–9 mm. .... 32. *B. pubescens.*

Young branches glabrous or puberulous. Ovary pilose. Pedicels only 3–5 mm. Calyx 1·2–1·5 cm. .... 33. *B. Dinklagei.*

3. Pedicels and bracteoles with harsh ferruginous indumentum. Ovary with dense, harsh hairs. Bracteoles larger and oblong .... 34. *B. batangensis.*

Species requiring further examination .... 35. *B. punctulata.*

iii. Flowers in axillary racemes.

Bracteoles squamiform, ovate-suborbicular, deciduous, remote from the calyx (finally half-way down the petioles or lower). Inflorescence and ovary both hairy. Branches and coriaceous leaves glabrous. Raceme narrow, 6–12 cm. .... 36. *B. polyantha.*

B. Striatæ. Bracteoles large (5–8 mm.), oblong to linear-oblong, conspicuously striated, with scattered hairs, often greenish. A pair of lanceolate, striated, stipular bracts, which are persistent, at the base of the pedicels. Ovary densely hirsute.

Leaves lanceolate, papyraceous, more or less softly hairy. Dense indumentum of yellow, villous hairs. Bracteoles linear-oblong, pilose. Hairs of the calyx spreading ...... 37. *B. pilosa.*

Leaves oval to broadly oblong, long-petioled, sub-coriaceous, practically glabrous. Indumentum of rather short, dark brown hairs. Bracteoles oblong, obtuse, thinly hairy. Calyx hairs brown, adpressed........................ 38. *B. calophylla.*

Leaves oblong-lanceolate to lanceolate, sub-coriaceous, glabrescent above, finely pubescent below, short-petioled. Indumentum formed of a dense brownish pubescence. Calyx-hairs yellow, adpressed .... 39. *B. elegans.*

C. Longibracteolatæ. Bracteoles longer than broad, oblong, lanceolate or linear (ovate or sub-orbicular in *macrocalyx* and *Henriquesiana*), often larger than in Sub-section A (small in *cuspidata*, *obovata*, and *cornifolia*), densely brown velvety.

1. Bracteoles ovate, ovate-oblong, or ovate-lanceolate. Ovary villous.

Bracteoles almost sub-orbicular. Inflorescence covered with dense, short, dark hairs. Calyx long (15 mm.). Leaves coriaceous, obtuse, conspicuously reticulate-veined .... 40. *B. macrocalyx.*

Bracteoles ovate-oblong, circa 5 mm. Inflorescence and stem with dense, short, yellow pubescence. Petioles up to 10 cm.; leaves broadly elliptic-oblong, up to 18 × 12 cm. .... 41. *B. maxima.*

Bracteoles ovate-lanceolate. Indumentum as in *B. maxima.* Leaves ovate to sub-orbicular. Petioles 4 cm.; blades 12 × 8 cm. .... 42. *B. orbiculata.*

2. Bracteoles oblong to oblong-lanceolate (sometimes ovate-oblong in *B. spathacea*). Ovary densely covered with short yellow hairs.

Bracteoles oblong to lanceolate-oblong, 6 mm. Flowers very large, up to 2·7 cm. Leaves lanceolate-oblong to obovate-oblong, with short cusps. Petioles 1 to 1·5 cm. .... 43. *B. Schweinfurthii.*

Bracteoles oblong-lanceolate, 5 mm. Flowers up to 1·5 cm. Petioles 5 to 10 cm. Blades 8 to 16 by 4 to 8 cm. .... 44. *B. longipetiolata.*

Bracteoles variable, ovate-oblong to ovate-lanceolate, 4–8 mm. The whole inflorescence with dense ferruginous pubescence. Ovary densely yellow pubescent. Leaves elliptic-oblong, narrowed to a blunt point, rather short-petioled .... 45. *B. spathacea.*

Bracteoles oblong, small, only 2–3 mm. Flowers resembling those of *B. spathacea*, but on a smaller scale and more numerous. Leaves much like those of *spathacea* .... 46. *B. borneensis.*

Species allied to *B. spathacea*, but available material insufficient for satisfactory discrimination .... { 47. *B. Vermeuleni.* 48. *B. compacta.*

3. Bracteoles lanceolate or linear.

(*a*) Ovary glabrous. Leaves glabrous or glabrescent on the upper surface.

(i.) Leaves ovate to sub-orbicular. Flowers in panicles.

Leaves deeply cordate. Bracteoles small. Inflorescence thinly hairy. Calyx villous, acute in bud .... 49. *B. cordifolia.*

Leaves slightly narrowed or rounded at the base. Inflorescence more hairy. Calyx obtuse in bud. Panicles long and lax .... 50. *B. Kirkii.*

(ii.) Leaves ovate, with very long cuspidate points.

Flowers 1 to 4 in the axils. Bracteoles subulate, only 2 mm. .... 51. *B. cuspidata.*

(*b*) Ovary hairy.

(i.) Leaves glabrous or glabrescent above.

Bracteoles lanceolate, 2·5 mm. Flowers to 4 together or in very short, few-flowered axillary racemes. Pedicels and calyx villous. Leaves shining above, oval, obtuse, or shortly acuminate. 52. *B. Busseana.*

Bracteoles linear, inserted on the pedicel. Leaves broadly obovate, with hardly any point and conspicuous nerves .... 53. *B. massaiensis.*

Bracteoles linear, at the base of the calyx. Leaves narrower, covered when young on their underside with dense, golden, silky hairs, as are the young shoots and inflorescence .... 54. *B. chrysophylla.*

(ii.) Leaves covered with short, grey pubescence, dense on the under surface; obtuse or emarginate.

Pedicels, calyx, and ovary ferruginous-villous ...... 55. *B. Henriquesiana.*

Pedicels and calyx grey-pubescent; ovary with whitish hairs .... 56. *B. obovata.*

Pedicels and calyx minutely puberulous; ovary with scanty adpressed hairs .... 57. *B. cornifolia.*

(iii.) Leaves, inflorescence, and shoots (at all events when young) covered with dense brownish villous hairs; leaves long-petioled, broadly elliptic-oblong .... 58. *B. Bequaertii.*

BAPHIA, DC. Prodr. ii. 424 (1825). Spreng. Syst. iv. pars 2, 158 (1827). Benth. & Hook. Gen. Plant. i. 553. Torre & Harms, Gen. Siphon. No. 3612. Engler & Prantl, Pflanzenfam. iii. 2. 198.

Delaria, Desv. Ann. Sci. Nat. ser. 1, ix. 406 (1826), excl. *D. ovalifolia.*
Carpolobia, G. Don, Gen. Syst. i. 370 (1831), quoad *C. dubia* et *C. versicolor.*
Bracteolaria, Hochst. Flora, xxiv. 658 (1841).

Sect. 1. BRACTEOLARIA, Benth. in Gen. Plant. i. 553 (1865).
Bracteolaria, Hochst. Flora, xxiv. 658 (1841), pro genere.

Calyx in anthesi bifidus vel bilabiatus.

1. B. RACEMOSA, Walp. Ann. vii. 801 (1868), non Baker, Fl. Trop. Afr. 248. *Bracteolaria racemosa*, Hochst. Flora, xxiv. 658 (1841); Walp. Rep. v. 565 (1846); Harvey, Thes. Cap. t. xx. (1859); Harvey & Sond. Fl. Cap. ii. 268 (1861); Wood, Natal Plants, t. 19; Sim, Forest Fl. Cape Col. t. 137. f. 8.

NATAL.

Macowan & Bolus, Herb. Norm. Austro-Afr. No. 69! *Rudatis*, Fl. Afr. Austr. Nos. 532! 792! *Krauss* No. 360! *J. Medley Wood* 568!

A shrub or small tree with fragrant flowers, locally known as the "Tree Violet."

B. racemosa, Baker in Oliver, Fl. Trop. Afr. ii. 248 (excluding synonymy) refers to a plant collected by Kirk in 1860 "in the highlands of the Batoka country" in Rhodesia. The specimens in Herb. Kew., named by Baker, are certainly not the *Bracteolaria racemosa* of Hochstetter, which does not seem to have been found outside Natal. What they are it is difficult to determine from the single sheet of indifferent material.

2. B. CAPPARIDIFOLIA, Baker, Journ. Linn. Soc. Bot. xxv. (1890) 311.

North-west Madagascar. *Baron* 5358! 6155! 6862! *Hildebrandt* 3098!

The plants recorded as *B. polygalacea* from Madagascar (*Hildebrandt* 3098 and *Baron* 6455) appear to me to belong to *B. capparidifolia.* They have sub-coriaceous leaves; the leaves narrow gradually to the apex, and the cuspidate point so characteristic of *polygalacea* is absent; and the inflorescence is much more hairy (densely so in Hildebrandt's plant, which appears to be a starved form). Moreover, true *polygalacea* has not been found outside the area of Guinea and Kamerun.

3. B. RADCLIFFEI, Baker f. in Journ. Linn. Soc. Bot. xxxviii. (1905) 147.

UGANDA. *Bagshawe* 74! 755! 1072! *Dummer* 3901! (alt. 1450 m.). *Ussher* 93! *Fyffe* 68! *Dawe* 972! (alt. 1300 m.).

Easily distinguished by the very small and delicate axillary racemes in clusters, generally shorter than the petioles, with capillary pedicels. The following description of the fruit may be added to Mr. Baker's account:—

Legumen monospermum, oblique-oblongum, 3–4 cm. × 1·5–2 cm., apice cornutum, superficie glabra, nigra, reticulata. Semen rufum, 2·5–3 cm. longum.

4. B. POLYGALACEA, Baker in Oliver, Fl. Trop. Afr. ii. 248 (1871). *B. Pynaertii*, De Wild. in Ann. Mus. Cong. ii. 143 (1907). *Bracteolaria polygalacea*, Hooker f. Niger Fl. 322 (1849). *Carpolobia dubia*, G. Don, Gen. Syst. i. 370 (1831).

UPPER GUINEA. Sierra Leone! Liberia! Nigeria!

KAMERUN. Virgin forest near Yaunde. *Zenker* 681! Fernando Po. *Mann*! *Barter*!

BELGIAN CONGO. Near Eala. *Pynaert* 239!

A note appended to a specimen gathered by A. E. Kitson in South Nigeria states that "the twigs are barked, smashed and used as torches, and that the plant is used as a cure for diarrhœa."

De Wildeman says of *B. Pynaertii*: "Cette plante nous a paru voisine de *B. polygalacea*, Baker, que nous ne connaisons, il est vrai, que par description." To me it seems indistinguishable.

This is a well-known and rather variable species. The plants recorded as *B. polygalacea* from Madagascar, as has been already said, are here referred to *B. capparidifolia.* There has been some confusion about the synonyms. Baker (*l. c.*) identified his *polygalacea* with *Delaria pyrifolia*, Desv., and Baillon in Bull. Soc. Linn. de Paris, i. 445 (1884) accepted the identification, but changed the name to *B. pyrifolia.* Harms, in Pflanzenfam. Nachtr. i. 200 (1897), accepted both the identification and Baillon's name, and specimens from Kamerun (*Preuss* 1257!) were issued from Berlin which are labelled *B. pirifolia.* But the identification is manifestly erroneous. *B. polygalacea* is a *Bracteolaria*, not a *Delaria*, and a mere glance at Desvaux's plate and description is enough to show that they have nothing to do with one another. *Delaria pyrifolia*, Desv. is a form of *Baphia nitida*.

5. B. LAURENTII, De Wild. in Miss. Laur. i. 105 (1905).

BELGIAN CONGO. Ikenge. No. 40.

Distinguished from *polygalacea*, as far as can be judged from the scanty material available, by the short inflorescences, and the conspicuous, rather numerous, parallel nerves on the under side of the leaves, as well as by the shorter petioles.

6. B. MULTIFLORA, Harms in Deutsch. Zentr.-Afr. Exped. ii. 243 (1910).

BENI. Bushy places and water-courses in hilly elephant-grass steppe. A liane with white flowers. No. 2442!

Harms distinguishes it from *polygalacea* and *racemosa* by the much harsher and longer indumentum of the inflorescence, from *Heudelotiana* by the smaller flowers, from *Zenkeri* and *Laurentii* by the much longer inflorescence.

7. B. HEUDELOTIANA, Baill. in Adans. vi. 216 (1866).

SENEGAMBIA. Dry, stony places at Rio Pongos. *Heudelot* 898!

There is a single specimen in Herb. Kew collected by Heudelot in 1838. Apparently it has never been re-found.

8. B. BANGWEOLENSIS, R. E. Fries in Fedde, Rep. Nov. Spec. xii. 51 (1913).

NORTH-EAST RHODESIA. In thick, dry, liana-covered forests near Lake Bangweolo. *Fries* 826.

No specimen seen. Characterised by the oval leaves with cordate base, rounded or occasionally shortly cuspidate at the top.

9. B. AURIVELLEREA, Taub. in Engl. Jahrb. xxiii. 174 (1897).

UPPER CONGO. Between Kimbundo and the Quango. *Pogge* 535!

Characterised by the villous, golden indumentum. The flowers are described as axillary, one or two together. No other species of the section *Bracteolaria* has anything but a racemose or paniculate inflorescence. The only specimen I have seen is too fragmentary to give any idea of the plant as a whole.

10. B. ZENKERI, Taub. in Engl. Jahrb. xxiii. 174 (1897).

KAMERUN. In apricis inter lapides ad Massa prope Yaunde Station circa 900 m. alt. *Zenker & Staudt* 492!

Distinguishable from *Heudelotiana* by the short racemes and the smaller, sub-coriaceous leaves, as well as the smaller flowers. From *capparidifolia*, which it resembles, it may be distinguished by the heavier indumentum and the rather broader leaves.

11. B. Lescrauwaetii, De Wild. in Ann. Mus. Cong. ii. 143 (1907).

Belgian Congo. Pania-Mutombo. *Lescrauwaet* 386!

Apparently only distinguishable from *B. Zenkeri* by the longer racemes and the shorter petioles.

Sect. 2. Delaria, Benth. in Gen. Plant. i. 553 (1865).
Delaria, Desv. in Ann. Sci. Nat. ser. 1, ix. 406 (1826).

Calyx spathaceus, in anthesi lateraliter fissus.

A. Microbracteolatæ. Bracteoles very small, often minute, reniform, suborbicular or broadly ovate.

12. B. nitida, Lodd. Bot. Cab. t. 367 (1819). Spreng. Syst. iv. pars 2, 175 (1827). *Delaria pyrifolia*, Desv. Ann. Sci. Nat. ix. 406 (1826) & t. 53. Linnæa, ii. 510 (1827). *Baphia hæmatoxylon*, Hooker f. Niger Fl. 321 (1849). *Carpolobia versicolor*, G. Don, Gen. Syst. i. 370 (1831). *Podalyria hæmatoxylon*, Schum. & Thonn. Pl. Guin. 222 (1828). *Baphia leptostemma*, Baill. Adans. vi. 214 (1866).

Upper Guinea. Sierra Leone! Gold Coast! Nigeria!

Kamerun. Batanga. *Bates*! Fernando Po. *Mann*!

Furnishes the "Cam-wood" or "Barr-wood" of commerce—a red dye. "As it grows old, red wood is produced inside the heart-wood and sold as Barr-wood." Native name "Irosun."

Loddiges's description leaves a good deal to be desired, and the accompanying plate is unsatisfactory and confused. Both were apparently taken from specimens which had originally been sent by Afzelius from Sierra Leone, and which Loddiges had long had in cultivation. This fact may explain the unusual shape of the leaves, which are represented as long and narrow with long cuspidate points, very different from the broad leaves with very short points which are commonly found in the species, and which are well portrayed in Desvaux's clear and good (if rather diagrammatic) plate of *Delaria pyrifolia*. The leaves in this species are very variable both in shape and in size, and different as the plates are, there can be little doubt that they both represent two different forms of one variable plant, and that a series could be arranged to illustrate the passage from one to the other. The narrow-leaved form is the less common, but there are specimens somewhat resembling Loddiges's plate in Herb Brit. Mus. from Sherbro Island, Sierra Leone (*Mrs. C. B. Hunter* 32 & 88), and in Herb. Kew. from Angianna in Nigeria (*Barter* 200). In a specimen from Oban in South Nigeria in Herb. Brit. Mus. (*P. A. Talbot* 1765) the leaves are at least 20 cm. in length.

13. B. angolensis Welw. ex Baker in Oliver, Fl. Trop. Afr. ii. 249 (1871); Hiern, Cat. Welw. Afr. Pl. i. 285 (1896).

Liberia. Banks of a stream, Mt. Barclay. *R. H. Bunting* 28! A variety with longer petioles.

KAMERUN. Abonando. *Rudatis* 48!

ANGOLA. Highlands of Golungo Alto. *Welwitsch, Iter Angolense* 601! Landana. *Gossweiler* 6075! A broad-leaved form. Monte Bello. *Gossweiler* 5414!

N.W. RHODESIA. Mumbeje River. *Gossweiler* 5182! 5295!

This and the next species are characterised by the very long and slender pedicels, and rather small leaves. A description of the fruit may be added to the account in the Fl. Trop. Afr.:—

Legumen lineare, 6–8 cm. × 1·0–1·25 cm., sæpius recurvatum, in cornu longum tenue rectum sensim desinens.

14. B. GRACILIPES, Harms in Engl. Jahrb. xxvi. 280 (1899).

KAMERUN. Lolodorf. Virgin forest. *Staudt* 209!

Closely related to *B. angolensis*, but differing in the shape of the leaves, which are broader and generally broadest above the middle, rounded at the top and abruptly cuspidate, with short points.

15. B. CONRAUI, Harms in Engl. Jahrb. xxxiii. 167 (1902).

KAMERUN. Bangwe. *Conrau* 152!

Very close to *B. gracilipes*. Harms distinguishes it by the larger points to the leaves—1·5 cm. in *gracilipes* and 1·5 to 2·5 in *Conraui*. The obovate form also seems to be less marked.

16. B. PREUSSII, Harms in Engl. Jahrb. xxxiii. 195 (1902).

KAMERUN. Kriby, in bushy forest on the southern border of the tobacco farm. *Preuss* 257!

Harms simply distinguishes it from *angolensis* by the thicker petioles and from *crassifolia* by the thinner texture of the leaves and the glabrous ovary. The last three species are very close together, perhaps too close to be kept specifically distinct, but the available material is very scanty in the case of the last two.

17. B. WOLLASTONI, Baker f. in Journ. Linn. Soc. xxxviii. 247 (1908). *B. Mildbraedii*, Harms in Deutsch. Zentr.-Afr. Exped. 1907–1908, ii. 242 (1914).

UGANDA. Ruwenzori W., alt. 1350 m. *Dr. A. F. R. Wollaston*! Forest near mouth of the Mpanga River, Toro. *Bagshawe* 1140! 1185! ("Common by streams"). Lake Albert Edward. *Bagshawe* 1314! *Kassner* 3271! Semliki Forest. *Dawe* 682!

BELGIAN CONGO. Semliki River. *Kassner* 3084! Semliki Ebene: steep water-courses on the grass steppe. *Mildbraed* 1995. Mawambi, banks of the Ituri River. *Mildbraed* 3078! The last two localities are both close to the Uganda border.

The specimen from Berlin makes it clear that *Mildbraedii* is identical with *Wollastoni*, and the latter name has six years' precedence.

A handsome, distinct shrub with large flowers and dark green, subcoriaceous, rather close-set leaves. The following description of the pod may be added to Mr. Baker's description of the plant:—

Legumen lineare, 6 to 8 cm. × 1·5 cm., apice leviter recurvatum, in cornu rectum mediocre desinens, superficie glabra, nitida, lævi, statu juniore viridescens mox olivaceum.

18. B. BIPINDENSIS, Harms in Engl. Jahrb. xxxiii. 165 (1902).

KAMERUN. Bipinde. Virgin forest. *Zenker* 1735! 2347! 4588!

FRENCH CONGO. Gaboon. *Klaine* 1264! (Herb. L. Pierre).

The pedicels resemble those of *angolensis*, but the leaves are of a very different texture, sub-coriaceous, and the ovary is not glabrous but covered with a dense, short pubescence.

19. B. LEPTOBOTRYS, Harms in Engl. Jahrb. xxvi. 282 (1898).

KAMERUN. Bipinde. *Zenker* 874! 3262! 2995! 2233! 4859! etc.

LIBERIA. Gola. *R. H. Bunting* 1910! 3422!

NIGERIA. Oban. *Talbot* 1554! 1761! 591!

Rather a variable plant as regards the size of the bracteoles and the shape and texture of the leaves. Harms originally described the bracteoles as ovate and minute, but in the copious series of specimens collected by Zenker they range from what may perhaps be called ovate to linear-oblong, and sometimes reach 3 mm. Indeed, the shape and size of the bracteoles in this species and *B. silvatica* might justify their inclusion in Sect. Longibracteolatæ but for the fact that the bracteoles are glabrous and that the general character of the two plants seems to indicate that their real affinities are with the present section.

Var. NIGERICA, Baker f. in Cat. Talb. Nig. Pl. 26 (1913).

This variety was established upon Talbot's 1554 from Oban, and is diagnosed as being distinguished by the narrow leaves and small bracteoles.

20. B. HYLOPHILA, Harms in Engl. Jahrb. xxvi. 282 (1898).

KAMERUN. Near Samisol, Miabokeberg. *Zenker* 1323!

FRENCH CONGO. Gaboon, Sibange Farm, Munda. *H. Soyaux* 37! 67! sub nomine "*B. angolensis* Welw. var.?"

21. B. SILVATICA, Harms in Engl. Jahrb. xlix. 434 (1913).

KAMERUN. Southern forest region. Bezvik Molundu, Jukaduma. *Mildbraed* 4662! Near Modika. *Mildbraed* 4308.

SOUTH NIGERIA. Oban. *Talbot* 591! 1761!

Allied to *leptobotrys*, but distinguished by the longer racemes and larger flowers, as well as by the thicker and longer persistent bracts and the larger, oblong bracteoles.

22. B. OBANENSIS, Baker f. in Cat. Talb. Nig. Pl. 25 (1913).

SOUTH NIGERIA. Oban. *Talbot* 1682 !

The single specimen in Herb. Brit. Mus. is cauliflorous. The lax, small-flowered racemes, the length of which is difficult to estimate as they are broken off, spring in a cluster of four or five from the bark of an old, moss-covered branch. The leaves closely resemble those of *hylophila*. The flowers are rather small, and the ovary, as far as can be seen in its very young state, appears to be glabrous.

23. B. BRACHYBOTRYS, Harms in Engl. Jahrb. xxvi. 281 (1899).

FRENCH CONGO. Gaboon. Tschintschotscho. *Soyaux* 148.

There is a sheet at Kew labelled "Afrikanische Gesellschaft. Loango Nsanga bei Chorichosco. Legit H. Soyaux. 5.11.1874. No. 148 !" which appears to be the plant from which Harms described the species.

24. B. BUETTNERI, Harms in Engl. Jahrb. xxvi. 281 (1899).

FRENCH CONGO. Gaboon. Forest near Sibange. *Buettner* 491 !

25. B. NANNANI, Baker f., sp. nova.

Arbor alta, ramis glabris, ramulis fusco-pubescentibus; foliis breviter petiolatis, oblongis vel oblongo-lanceolatis, longe acuminatis, apice ipso obtusis, basi rotundatis, glabris, nervis lateralibus utrinque 7–9 arcuatis, costa subtus prominente; floribus albis, sæpissime solitariis, axillaribus, pedicellis brevibus ferrugineo-pubescentibus; bracteolis parvis, semi-orbicularibus; calyce spathaceo, glabro; carina naviculariformi; ovario lineari, glabro; leguminibus juvenilibus glabris.

Leaves 8–11 cm. long by 3–4 broad; petiole 7–8 mm. Pedicels 7–9 mm. Calyx 12–14 mm. Carina ± 13 mm.

BELGIAN CONGO. Near Boyeka. *Nannan* 128 ! "In the forest and in marshy places; a large tree. Native name Lomangga."

Related to *B. pubescens* and *B. crassifolia*, but distinguished from both by the glabrous ovary, the shorter pedicels, and the longer points to the leaves.

26. B. ACUMINATA, De Wild. in Miss. Laur. i. 104 (1905).

UPPER CONGO. Basoko. Wanie Rukula !

Closely related to *B. Nannani*, which it resembles in the shape and size of the leaves and the solitary flowers, but distinguished from it by the hairy ovary.

27. B. BAROMBIENSIS, Taub. in Engl. Jahrb. xxiii. 177 (1897).

KAMERUN. Barombi. *Preuss* 115 ! 512 ! Johann-Albrechtshöhe. *Staudt* 635 ! Bipinde. *Zenker* 2249 ! 2986 !

SOUTH NIGERIA. *A. E. Kitson* 1909! "Forest tree. Sandy." Oban. *Talbot* 1764!

The whole plant is rather softly hairy when the leaves and branches are young.

28. B. CRASSIFOLIA, Harms in Engl. Jahrb. xxvi. 280 (1899).

KAMERUN. Lolodorf. *Staudt* 160! Bipinde. *Zenker* 4987! 4670! 4401! 1216! 2519! 1304!

SOUTH NIGERIA. Oban. *Talbot*!

BELGIAN CONGO. "Vallée de la Djuma. *Gentil.* Loanga. *Gentil* 28." Ann. Mus. Cong. ser. 5, vol. i. 131.

This species is best recognised by the combination of a glabrous or glabrescent calyx with a velvety pedicel and by the thick-petioled coriaceous leaves. But it appears to be rather variable.

Var. DUSENII, Harms, *l. c.* "Typo similis, differt non nisi foliis latioribus (ovatis vel ovato-oblongis vel oblongis)."

KAMERUN. *Dusén.*

The leaves of many species of *Baphia* are very variable. I doubt the wisdom of naming a variety on the ground of a mere difference in breadth.

29. B. DENSIFLORA, Harms in Engl. Jahrb. xxvi. 280 (1899).

CONGO. Near Mukenge. *Pogge* 819!

NIGERIA. Oban. *Talbot* 1719! Eket district. *Talbot* (unnumbered)!

GABUN. *Mann*! (the same form as Talbot's 1719).

Harms notes that the leaves often fall off and leave long, bare panicles of flowers. This feature is well shown in Mann's plant and in Talbot's 1719. Near *crassifolia*, but the indumentum is more dense and the young branches are covered with a dense pubescence.

30. B. MYRTIFOLIA, Lester-Garland, sp. nova.

Arbor vel frutex stricta, ramulis glabrescentibus. Folia petiolata (petiolo 5–6 mm. longo, statu juniore parce adpresse-piloso), anguste oblongo-lanceolata, basi rotundata, apice breviter acuminata, glabra et nitida supra, nervis subter ± pilosis, minute punctulata, brunneo-viridia, chartacea. Flores ad axillos foliorum fasiculatim (2–5) dispositi; pedicelli primum dense ferrugineo-pubescentes, serius glabrescentes, tenues sed stricti, apicem versus incrassati, usque ad 17 mm. longi, patentes. Bracteolæ minimæ, squamiformes; calyx spathaceus, 10 mm. longus, statu juniore apice dense pubescens, cæterum glaber vel glabrescens, denique minute puberulus; vexillum circa 12 mm. longum; ovarium adpresse pubescens; stylo glabro.

SOUTH NIGERIA. *Talbot* (unnumbered) 1912–13!

This plant is intermediate between *B. bipindensis* and *B. crassifolia.* The long, slender pedicels suggest the former, but they are stiff instead of flexible,

and when young they are covered with exactly the same sort of pubescence as those of *crassifolia*, whereas in *bipindensis* they are glabrous from the beginning. The general character of the inflorescence also indicates that the plant belongs to the *crassifolia* type.

31. B. ERIOCALYX, Harms in Engl. Jahrb. xxxiii. 165 (1902).

KAMERUN. Bipinde, in the virgin forest. *Zenker* 2380! 4869! 3159! 4141!

Easily recognisable by the dense whitish indumentum of the pedicels and calyx and the very short petioles. The bracteoles are inserted upon the pedicel, not upon the calyx itself, from which they often stand at an appreciable distance; but this feature is not so pronounced as in *B. polyantha.*

32. B. PUBESCENS, Hook. f. Niger Fl. 320 (1849). *B. laurifolia,* Baill. Adans. vi. 213 (*fide* Baker, Fl. Trop. Afr.).

GOLD COAST. *Farmer* 539! *Chipp* 452!

NIGERIA. *Barter* 1617! *Baumann* 15! *Elliott* 177! *Foster* 219!

BELGIAN CONGO. De Wildeman, Ann. Mus. Cong. ser. 5, vol. i. 255, vol. ii. 143, and vol. iii. 197, gives ten different localities. In Deutsch. Zentral-Afr. Exped. 243 it is also recorded from Aruwimi.

KAMERUN. Yaunde. *Zenker* 1411!

A shrub or small tree with rather small, crowded leaves and flowers in clusters of 1 to 4 in the axils on the main branches. Very variable in the indumentum. In the typical plant the young branches, floral axis, pedicels, calyx, and ovary are all covered with a dense, short pubescence, and the under surface of the young leaves and the petioles are densely silky, but the young branches and petioles sometimes have only scattered hairs, the pedicels may be glabrate, and the calyx minutely puberulous, while the hairs on the young leaves are sometimes confined to the nerves.

33. B. DINKLAGEI, Harms in Engl. Jahrb. xxvi. 279 (1899).

LIBERIA. Grand Bassa, Fishtown. Thickets on the sandy foreshore. *Dinklage* 1664! "In fruticetis solo subhumido persæpe." *Dinklage* 1975!

The flowers are larger and the petioles shorter than in *pubescens.* The ovary also is covered with longer hairs. In the herbarium specimens the flowers appear to be in terminal racemes, probably owing to the falling-off of the leaves.

34. B. BATANGENSIS, Harms in Engl. Jahrb. xxxiii. 166 (1902).

KAMERUN. Batange. *Dinklage* 926!

Described as a shrub with villous young branches, petioles, pedicels, calyx, and ovary. Distinguished from *pubescens* by the larger bracteoles (3 mm.) and calyx (11 mm.), and by the harsh character of the indumentum.

35. B. PUNCTULATA, Harms in Engl. Jahrb. xl. 32 (1908).

EAST AFRICA. Hills near Lake Tandangongoro; c. 250 m. in thick bushy forest. *Busse* 2486!

From the scanty material available it has been found impossible to deal satisfactorily with this species. It is clearly closely related to some forms of *crassifolia*, e. g. *Zenker* 2982 A & 2519, but the petioles are not so thick and the venation of the leaves on the under side is more delicate. It is also rather like a glabrescent form of *pubescens*; but the probability is that it is distinct from both, as it comes from the opposite side of Africa. The bracteoles are described as very broad and short, sub-orbicular or reniform; the flowers one to three together in the axils; the pedicels rather long and brown-velvety; the calyx pubescent; the ovary "margine hirsuto."

36. B. POLYANTHA, Harms in Engl. Jahrb. xl. 32 (1908).

KAMERUN. Bipinde. *Zenker* 2685! 2988 A! 4114!

Harms lays great stress upon the position of the bracteoles, which "are not placed immediately or almost immediately at the base of the calyx, but nearly in the middle of the pedicel or a little above its base." The bracteoles stand at a distance from the calyx in some of the other species (e. g. *obovata*, *cornifolia*, and *eriocalyx*), but never so far as *polyantha*. When this is the case they are often deciduous. This very distinct plant has several other easily recognisable features—the rather long and very narrow axillary racemes and the large, dark-coloured, deciduous bracts among others.

B. STRIATÆ. Bracteoles large, oblong to linear-oblong, conspicuously striated, with scattered hairs. A pair of lanceolate, striated, persistent stipular bracts at the base of the pedicels.

37. B. PILOSA, Baill. in Adans. vi. 216 (1866); Baker in Oliver, Fl. Trop. Afr. ii. 249 (1871).

GABUN. *Duparquet* 29 (Baillon). *Klaine* 2156! 859! (ex herb. L. Pierre).

ANGOLA. Woods at Pango Munga. *Gossweiler* 6483!

A woody climber. Easily recognised by the long, soft, fawn-coloured hairs of the inflorescence and petioles. In the species of this section the pedicels spring from the axil of a bract which is usually very small and disappears early, and which bears at its base a pair of stipules. When the bract falls off, the stipules remain and look like a pair of bracts at the base of the pedicels. Sometimes no flower develops in the axil, and then the bract itself is generally persistent and grows larger, and the true nature of the stipules becomes apparent.

38. B. CALOPHYLLA, Harms in Engl. Jahrb. xlix. 433 (1913).

KAMERUN. Bipinde. Virgin forest. *Zenker* 4602!

Easily distinguished from *pilosa* by the broad, shining, coriaceous leaves, the short dark brown indumentum of the inflorescence, and the greenish, thinly pilose bracteoles.

39. B. ELEGANS, Lester-Garland, sp. nova.

Frutex scandens vel decumbens, ramulis junioribus dense pubescentibus, adultis glabrescentibus. Folia petiolata (petiolo piloso circa 1 cm. longo), lanceolata vel oblongo-lanceolata, basi rotundata, apice sensim acuminata, chartacea, supra atro-viridia (ut videtur) et glabra nisi in nervis depressis, subtus plus minus obsita pilis brevibus sparsis adpressis, nervis dense pilosis. Flores in racemos axillares (c. 3 cm.) dispositi; rhachis et pedicelli dense pubescentes; pedicelli stipulis bracteiformibus duobus persistentibus suffulti, bractea ipsa minuta et mature decidua seu rarius per abortionem floris crescente et persistente; bracteoli 4–5 mm. longi, ovato-oblongi, virides, striata, extus adpresse pilosis, intus glabris. Calyx spathaceus, circa 9 mm. longus, pilis fulvis adpressis obsitus; vexillum ad 1·7 cm. latum, margine eleganter minute undulato; ovarium pilis longis dense obsitum.

KAMERUN. Batanga. *G. L. Bates* 154!

There are two sheets of this plant at Kew, on one of which it is described as "climbing high over trees. Thick bush: not uncommon"; on the other, as a "trailing or climbing vine" with white flowers. It is clearly distinct from the other two species of the section. From *pilosa* it is distinguished by the short close indumentum and the stiffer, almost sub-coriaceous leaves; from *calophylla* by the smaller and much narrower leaves and the absence of the dark brown indumentum which characterises that species.

Var. VESTITA. Tota inflorescentia pilis fulvis sed multo brevioribus quam in *B. pilosa* vestita. Flores permulti, racemis in panniculos plus minus densos congestis.

GABUN. *Klaine* 2457!

This is the plant referred to by Harms in his account of *B. calophylla* as a form of *B. pilosa* with shorter indumentum. But the leaves are quite different from those of *pilosa* and exactly resemble those of *elegans*, and the general look of the inflorescence suggests what the latter species would be if covered with longer hairs.

C. LONGIBRACTEOLATÆ. Bracteoles longer than they are broad, generally oblong, lanceolate or linear, and larger than in the Sub-section A.

40. B. MACROCALYX, Harms in Engl. Jahrb. xl. 33 (1908), with Plate.

EAST AFRICA. Eastern slope of the Rondo plateau; sunny thickets. *Busse* 2557! Lindi. *Busse* 2980. Nondoro. *Braun* 1203.

The bracteoles in this species are almost sub-orbicular, but too large for Sub-section A and covered with a brown-velvety indumentum. It is easily recognisable by the long calyx, the short dark brown hairs of the inflorescence, and the coriaceous, net-veined leaves. As has been already said, Harms' proposed section *Macrobaphia* can hardly be maintained as of equal value with *Bracteolaria* and *Delaria*, and the character upon which it is formed—the size and distinctness of the calyx-teeth—is not confined to this species, but is often observable in others to a greater or less degree.

41. B. MAXIMA, Baker in Oliver, Fl. Trop. Afr. ii. 250 (1871).
KAMERUN. Banks of the Cameroon River. *Mann* 2224 ! (1863).

There are three sheets at Kew of Mann's gathering of this fine species, which does not seem to have been found since his time.

42. B. ORBICULATA, Baker f. in Cat. Talb. Nig. Pl. 25 (1913).
SOUTHERN NIGERIA. Oban. *Talbot* 1557 ! 23 bis !

Near *B. maxima*, but on a smaller scale. The bracteoles are of different shape, pointed instead of obtuse, and the leaves are smaller and proportionately broader.

43. B. SCHWEINFURTHII, Taub. in Engl. Jahrb. xxiii. 175 (1897).
BAHR-EL-GHAZAL. *Schweinfurth* 3317 ! (Monbutto) 3551 ! (Kibali).
NORTH-EAST CONGO. Uele district (*fide* De Wild. Plant. Thonn. Cong. ii. 146).

This is another fine species—"ob florum magnitudinem et filamentorum indumentum insignis, ex affinitate *B. longipetiolata*" according to Taubert. The filaments are described as "cinereo-pilosa" (!), but nothing is said about the filaments in the description of *longipetiolata*. Schweinfurth's numbers are both at Kew. The size of the flowers is certainly remarkable.

Var. HARMSII, H. Winkl. in Engl. Jahrb. xli. 277 (1908).
KAMERUN. Lokundje-Mündung. *Winkler* 837.
"A typo foliis latioribus brevioribus manifeste distincta."

44. B. LONGIPETIOLATA, Taub. in Engl. Jahrb. xxiii. 176 (1897).
KAMERUN. Abo. *Buchholz*.
SOUTH NIGERIA. Main road from Oron to Eket. *Talbot* 1912–1913, without a number. Herb. Brit. Mus. (ex descriptione).

There is no authentic specimen at Kew or the Brit. Mus., but Talbot's plant seems to answer well to the description, and the relation to *Schweinfurthii* is clear. The chief differences are the smaller size of the flowers and the much longer petioles. In both species the flowers are arranged in a narrow terminal panicle, owing to the falling-off of the leaves from the axils of which they arise.

45. B. SPATHACEA, Hook. f. Niger Fl. 220 (1849).
LIBERIA. Bassa Cove. *Ansell* !
KAMERUN. *Mann* 2219 ! Fernando Po. *Barter* 1613 !

South Nigeria. Oban. *Talbot* 1331! 1555! 1209! *Thomas* 2336! *Unwin* 82!

North-West Congo. Recorded by De Wildeman (Ann. Mus. Cong. ser. 5, i. 144) from Irebu, Bombimba, Brazzaville, and Lukolela; also from Uele (Pl. Thonn. Cong. 146).

The leaves of this species are very variable in size. Those of Ansell's type-specimens in Hooker's Herbarium at Kew measure about 9 cm. by 4; in Talbot's 1555 they run up to 20 cm. by 8, and there are all sorts of intermediates. The bracteoles also vary both in size and shape. The whole of this group is characterised by the dense brown velvet of the inflorescence in combination with dense yellow hairs or pubescence on the ovary.

Var. scandens, De Wild. Ann. Mus. Cong. ser. 5, ii. 144.

Upper Congo. Yambruga. *Pynaert* 58! *Talbot* 1331!

Described as a climber, and differentiated by the hairy petioles and under surface of the leaves. But the petioles are normally hairy in the type, and only become glabrous when they are old, though described in the Niger Flora as glabrous because the original type-specimens were old.

46. B. borneensis, Oliver in Hooker, Ic. Plant. t. 2456 (1826).

Borneo. Limbang River. *Haviland* 57! Sandekan. *Creagh*! Tenom. *Miss L. S. Gibbs* 3120! Baram district, Sarawak. *Hose* 82! Mnara, Brunei. *Hose* 15!

All these localities are in the north of the island, Sarawak, and British North Borneo. Nearly related to the West African *B. spathacea*, but distinguished by the smaller bracteoles and flowers, the longer pedicels, and the more delicate character of the whole inflorescence.

47. B. Vermeuleni, De Wild. in Ann. Mus. Cong. i. 255, t. li. (1906).

Lower Congo. Sanda. *Gillet* 3409! 3432!

So far as can be judged from the material available, this species is related to *B. spathacea*, but has smaller flowers and smaller bracteoles, in both which respects it resembles *B. borneensis*. The leaves, however, are thin and glabrous, and rounded at the top, somewhat resembling those of *B. massaiensis*.

48. B. compacta, De Wild. in Ann. Mus. Cong. ii. 142 (1907).

Lower Congo. Lukolela. *Pynaert* 187!

Distinguished from *B. spathacea* by De Wildeman "par le port," but the scanty material gives no help in this respect. The flowers are said to be borne in compact fascicles close together along the branches (which is sometimes the case with *spathacea*), with differently shaped leaves and much longer petioles (up to 8 cm.). The last feature, however, is not confirmed by the specimen received. Is it really distinct?

49. B. CORDIFOLIA, Harms in Engl. Jahrb. xxxiii. 167 (1904).

EAST AFRICA. Usagara district. Ugogo, bushy forest between Ilindi and Nsali. *Busse* 240!

Clearly related to *B. Kirkii*, but recognisable at once by the deeply cordate leaves, which are unlike any others in the genus.

50. B. KIRKII, Baker in Oliver, Fl. Trop. Afr. ii. 250 (1871). *Millettia pirifolia*, Vatke in Oesterr. Bot. Zeit. 1878, p. 215. *Baphia ovata*, Sim, For. Fl. Port. East Afr. 42, t. 49 (1909).

ZANZIBAR. Dar Salam. *Kirk* 136! *Busse* 17! "Küste. Dar-es-Salam: im Djungel. Arbor 4 m. alt." *Hildebrandt* 1213! sub nomine *Millettia pirifolia*, Vatke.

PORTUGUESE EAST AFRICA. "Juxta aquam: Quisica et McChopes passim." T. R. Sim, l. c. *Sim* 5279. "Timber valuable."

Vatke's plant is identified with *B. Kirkii* in Engl. Das Pflanzenw. Ost-Afr. Part C, p. 203. I had reached the same conclusion independently. His specimens are in fruit, and match the fruiting specimens at Kew. The specimen from which Sim's plate is taken was also in fruit (he had not seen the flower), and there can be little doubt that his plate also is *B. Kirkii*. The pods are unmistakable.

Legumen maximum, 9–13 cm. × 3–4 cm., lignosum, oblique oblanceolatum, apice cornutum. Semina nigra, compressa, sub-orbicularia, læviuscula, circa 1·5 cm. × 1·7 cm.

51. B. CUSPIDATA, Taub. in Engl. Jahrb. xxiii. 176 (1897).

GABUN. Woods on the eastern slope of the Gabun-Munda watershed. Sibange Farm. *Soyaux* 324! "Scandens."

The points of the leaves are much longer than those of any other species of *Baphia*. Very unlike any other of the *Longibracteolatæ*, but the shape of the bracteoles, which are subulate though very small, is decisive as to its true position.

52. B. BUSSEANA, Harms in Engl. Jahrb. xxxiii. 166 (1904).

EAST AFRICA. Between Libunga River and Matanda, in open bush. *Busse* 1001! Near Milonji River, Myombo. *Busse* 993.

53. B. MASSAIENSIS, Taub. in Engl. Pflanzenw. Ost-Afr. C. 203 (1895).

EAST AFRICA. Salanda. *Fischer* 195!

Distinguished from *Busseana* by the rounded leaves, which are broadest above the centre and have very short, blunt points.

54. B. CHRYSOPHYLLA, Taub. in Engl. Jahrb. xxiii. 175 (1897).

UPPER CONGO. *Pogge* 793, 802, 852! 896, 898.

"Species ex affinitate *B. spathaceæ* et *B. pubescentis*, ab utraque foliis subtus aureo-sericeis facile distinguenda." But the bracteoles are linear and caducous, which is very unlike those two species, and the general aspect of the type specimen is very different. It is apparently an elegant species, with thin, flexible twigs.

55. B. HENRIQUESIANA, Taub. in Engl. Jahrb. xxiii. 176 (1897).

ANGOLA. Huilla. *Antunes* 177, A. 10! Chihinde; sandy places, 1270 m. No. 60 (Kunene-Zambesi Exped. p. 253). Kassuango Kuiriri. *Gossweiler* 4048! River Cuanha, Kubango. *Gosweiler* 2113!

56. B. OBOVATA, Schinz in Bull. Herb. Boiss. iv. 815 (1896).

KUNENE DISTRICT. Ambo Land. *Wulfhurst* 22. *Rautenen* 321! 604!

RHODESIA. Victoria Falls, "common shrub on high veldt." *Allen* 141! *Rogers* 5586! Malindi, "common shrub." *Allen* 158! On the Wankie line, 80 miles north of Buluwayo. *Eyles* 1128!

This and the next species are very closely related. They may be recognised at once by the whitish look of the leaves, which is more conspicuous than in *Henriquesiana,* and is caused by a minute pubescence, and also by the very conspicuous primary nerves. In both, the small linear bracteoles are deciduous, and are inserted on the pedicel below the calyx. The leaves often fall off, leaving a more or less naked panicle, as is the case with some other species of *Baphia.*

57. B. CORNIFOLIA, Harms in Baum, Kunene-Zambesi Exped. 252 (1903).

KUNENE DISTRICT. River Chitanda, 1100 m. *Baum* 121!

Harms describes his plant as "a shrub up to two metres, with white flowers with a scent like those of *Robinia Pseudacacia.*" It is perhaps doubtful whether this species is really distinct from *obovata,* from which it only seems to differ in the much shorter indumentum of the inflorescence and the scantier, adpressed hairs of the ovary. Rautenen's No. 321 is more or less intermediate between them.

58. B. BEQUAERTII, De Wild. in Fedde, Rep. xiii. 116 (1914).

SOUTH CONGO. Elizabethville (Katanga district). *Bequaert* 340.

NORTH-WEST RHODESIA. Bwana Mkubwa. "Universal, up to five or six metres: a much-branched shrub in open dry forest." *R. E. Fries* 334, 337. *Rogers* 10086! 10378! (1500 to 1600 metres). Kului-Kubango *Gossweiler* 2105! Between Broken Hill zinc mine and Bwana McCuba copper mine. *Allen* 378!

There is no specimen of Bequaert's No. 340 at Kew or in the Brit. Mus., but Fries (Schwed. Rhodes.-Kongo Exped. 73 (1913)), who was evidently familiar with the species, determined Rogers's 10086 and 10378 and Gossweiler's 2105 as belonging to this species.

A striking form, unlike anything else in the genus, recognisable by the very dense indumentum and the shape of the adult leaves, which are sometimes almost rectangular in outline with the angles rounded off.

De Wildeman, *l. c.*, described two closely-related species, *B. Bequaertii* and *B. Ringoeti*, the latter based on Ringoet No. 1 from the Niewdorp in the Katanga district. I am not convinced that these are more than two forms of the same plant. He relies for distinctive marks upon the leaves, which are said to be crowded together at the ends of the branches and glabrous above and only sparsely hairy beneath in *Bequaertii*, but scattered and densely hairy both above and beneath in *Ringoeti*. Rogers's 10378, which Fries named *Bequaertii*, corresponds to this description of *Ringoeti*. The other specimens at Kew and at the Brit. Mus. answer more nearly to *Bequaertii*, but the congestion of the leaves and flowers suggests an accidental shortening of the young shoot rather than a normal development, and it is easy to trace a progressive loss of hairs on the two surfaces of the leaves as they grow older.

EXCLUDED NAMES.

"*B. africana*, Afz." Baill. in Laness. Pl. Ut. Col. Fr. 341 (1886). Nomen solum.

"*B. congolensis*, Welw. ex Baker in Fl. Trop. Afr." This name appears in De Wild. Miss. Laur. i. 105. "*Congolensis*" is obviously a clerical error for *angolensis*, but the mistake is repeated in the index.

"*B. lancifolia*, Baill. ex Laness. Pl. Ut. Col. Fr. 340. Nomen" has found its way into the 'Index Kewensis,' Suppl. 1. This also appears to be a clerical error. The plant there mentioned is *B. laurifolia*, Baill., and there is a description. There is no description of *B. africana*, Afzel. which follows it, and which is not included in the 'Index Kewensis' at all.

[NOTE.—Since this paper has been in type it has become evident that *Baphia Radcliffei*, Bak. f. is identical with *Baphiopsis Stuhlmannii*, Taub. in Engl. Pflanzenw. Ost.-Afr. C. 203 (1895). This was kindly pointed out by Prof. Harms, to whom a specimen of the *Baphia* had been sent and who sent a specimen of the *Baphiopsis* in return.—15*th April*, 1921.]

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B. eriocalyx, Harms 31
B. gracilipes, Harms 14
B. hæmatoxylon, Hook. f. 12
B. Henriquesiana, Taub. 55
B. Heudelotiana, Baill. 7
B. hylophila, Harms 20
B. Kirkii, Baker 50
"*B. lancifolia, Baill.*" error
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B. massaiensis, Taub. 53
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B. Nannani, Baker f. 25
B. nitida, Lodd. 12
B. obanensis, Baker f. 22
B. obovata, Schinz 56
B. orbiculata, Baker f. 42
B. ovata, T. R. Sim 50
B. pilosa, Baill. 37
B. polyantha, Harms 36
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B. Preussii, Harms 16
B. pubescens, Hook. f. 32
B. punctulata, Harms 35
B. Pynaertii, De Wild. 4
B. pyrifolia, Baill. 12
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B. Radcliffei, Baker f. 3
B. Ringoeti, De Wild. 58
B. Schweinfurthii, Taub. 43
  Var. Harmsii, H. Winkl.
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A Systematic Account of the Plants collected in New Caledonia and the Isle of Pines by Prof. R. H. Compton, M.A., in 1914.—PART I. Flowering Plants (Angiosperms). By A. B. RENDLE, D.Sc., F.R.S., F.L.S., E. G. BAKER, F.L.S., and SPENCER LE M. MOORE, B.Sc., F.L.S.

(PLATES **13-24**.)

[Read 2nd February, 1920.]

INTRODUCTION.

THE collection of which the following is a systematic account was made by Prof. R. H. Compton in New Caledonia and the Isle of Pines during 1914, with the aid of grants from the Royal Society, the Percy Sladen Trust Fund, and the Worts Travelling Fund of Cambridge University. Collecting materials were also provided by the Cambridge Botany School and the British Museum, Natural History.

The specimens collected have been presented to the British Museum, where the greater part have been determined.

Prof. Compton hopes later to publish a paper or papers dealing with the New Caledonian vegetation from the standpoints of Ecology and Geographical Distribution. A considerable quantity of material was preserved in a condition suitable for morphological and anatomical research, and several papers are foreshadowed on these aspects of some of the interesting forms in which the Flora of New Caledonia is so extraordinarily rich. A general account, including a description of the geology, topography, and climate of the Islands has been communicated by Prof. Compton to the Royal Geographical Society *.

The various groups have been elaborated as follows :—Flowering Plants : Angiosperms by Dr. A. B. Rendle (Monocotyledons), Mr. E. G. Baker (Polypetalous Dicotyledons), and Mr. Spencer Moore (Sympetalous and Apetalous Dicotyledons); Gymnosperms and Ferns by Prof. R. H. Compton; Mosses by M. Theriot; Hepatics by Prof. J. B. Farmer; Characeæ by Mr. J. Groves; Marine Algæ by Mr. A. Gepp; Fresh-water Algæ by Dr. Nellie Carter; Fungi by Miss E. M. Wakefield; Lichens by Miss A. Lorrain Smith, and Mycetozoa by Miss G. Lister.

At Prof. Compton's request I undertook the task of arranging the material for publication.

The present paper contains a systematic account of the angiospermous Flowering Plants, and enumerates 830 species, 230 of which are new; and there are ten new genera. The flora of New Caledonia is of exceptional interest, especially in regard to the large number of peculiar endemic forms, and Prof. Compton has added materially to our knowledge of the vegetation and its distribution. In addition to the large proportion of new genera and species, a number are now recorded for the first time from the Island. The latter include the anomalous genus of Amaryllidaceæ, *Campynema*, hitherto known only in one (or perhaps two) species from Tasmania, the Australian genus of Euphorbiaceæ, *Ricinocarpus*, the Malayan genus *Lucinæa* (Rubiaceæ), and the Indo-Malayan and Australian genera *Gmelina* (Verbenaceæ) and *Litsæa* (Lauraceæ).

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* "New Caledonia and the Isle of Pines." By R. H. Compton, M.A. Geographical Journal, xliv. No. 2, Feb. 1917.

The new genera are *Comptonella* (Rutaceæ), *Salaciopsis* (Celastrineæ), *Montagueia* (Anacardiaceæ) (commemorating the late Mr. P. D. Montague, zoologist to the expedition), *Paracryphia* (Eucryphiaceæ), *Enochoria* (Araliaceæ), *Merismostigma* (Rubiaceæ), *Tropalanthe* (Sapotaceæ), *Depanthus* (Gesneraceæ), *Adenodaphne* (Lauraceæ), and *Dendrophyllanthus* (Euphorbiaceæ).

The four families represented by the greatest number of species in the collection are Orchidaceæ, Euphorbiaceæ, Rubiaceæ, and Myrtaceæ, and these families also head the list in M. Guillaumin's "Catalogue des plantes phanerogames de la Nouvelle-Caledonie" (Ann. Musée Colonial de Marseille, 1911), and provide a large proportion of the novelties described in the present paper. The families Saxifragaceæ, Apocynaceæ, and Leguminosæ are also well represented.

In order to save space and reduce the cost of printing the systematic account has been condensed as much as possible. Distribution is indicated only in species which are not endemic. It has been convenient to follow the arrangement of the families, under Monocotyledons and Dicotyledons, adopted in Bentham and Hooker's 'Genera Plantarum.'

A. B. Rendle.

MONOCOTYLEDONS.

By A. B. Rendle.

ORCHIDACEÆ.

Microstylis polyphylla Ridl. Comboui Mts.; forest humus; serpentine; 3000 ft. 2185. Flowers dull red on yellowish ground, lip with deep crimson blotch.

Liparis laxa Schlechter. Comboui Mts.; bare rocks in *Spermolepis* forest, near stream; serpentine; 1500 ft. 2176. Flowers red-brown.

Dendrobium finetianum Schlechter. Ignambi; epiphyte; forest; 3500 ft. 1539. Mt. Koghi; on tree-trunks in forest; 3000 ft. 727.

River Ngoyé; *Spermolepis* forest; 500 ft. 1003. Flowers greenish yellow, lightly streaked with brown, lip creamy white with brown-purple streaks.

DENDROBIUM FRACTIFLEXUM Finet. Kuakué; terrestrial, in woods on steep hill-sides; 500 ft. 897. Lip oscillating, dark green inside at base, full magenta in middle, pale at apex; other perianth-segments turned upwards and outwards, pale dull magenta, finely spotted and veined.

D. VERRUCIFERUM Rchb. f. Presqu'île Bogota; terrestrial; serpentine scrub; 1500 ft. 1321. Lip hinged, green, other perianth-segments brownish.

D. PECTINATUM Finet. Mt. Panié; epiphyte; forest; 4000 ft. 1816. Tonine; on trunks in scrubby summit woods; 3500 ft. 1947. Flowers pale yellow with reddish longitudinal streaks except on lip.

D. AUSTRO-CALEDONICUM Schlechter. River Ngoyé; on trunks, forest margin; 400 ft. 2050. Flowers apricot-coloured; fruit with dull yellowish ridges and green furrows.

D. ELEUTHEROGLOSSUM Schlechter. Poume; on trees in scrubby woods; 1200 ft. 2372. Flowers pale yellowish green with purple pattern on lip.

D. COMPTONII Rendle, sp. nov. (Pl. **13**. fig. 13.) Planta epiphytica; *caulibus* cylindricis circa 1 cm. crassis, siccis valde sulcatis; *foliis* 4–5, apicem versus congestis late lanceolatis apice bilobulatis coriaceis 12–13 cm. long., 2·8–3·8 cm. lat.; *racemis* folia paullo excedentibus multifloris 12–14 cm. long.; *floribus* carnosulis luteis externe sanguineo-punctatis, pedicellis tenuibus 1–1·5 cm. long.; *bracteis* minutis, lineari-angustatis; *sepalis* et *petalis* 8–9 mm. long.; sep. dorsale oblongo obtuso, sep. lateralia e basi latiore late oblongo-falcata paullo excedente; *petalis* subfalcate oblongis obtusis ad sepalorum margines cohærentibus; *labello* 5 mm. long., 3-lobo, lobo medio oblato 3·5 mm. long., 3 mm. lat., superne breviter acuminato disco lineis 2 elevatis instructo, lobis lateralibus vix 1 mm. longit. excedentibus suberectis obtusis; *columna* breve lata 2 mm. long.

Mt. Canala; forest; 1000 ft. 1151. In flower June. Stems yellow, almost covered with the whitish thinly membranous remains of the leaf-sheaths. A member of the *Speciosa* group, recalling the Australian *D. gracilicaule* F. Muell., but a much larger plant.

BULBOPHYLLUM NEOCALEDONICUM Schlechter. Ignambi; moist forests; attached to trunks by long slender roots; 3000 ft. 1702. Flowers transparent greenish.

B. NGOYENSE Schlechter. No note of locality. 2044.

B. LINGULATUM Rendle, sp. nov. Planta parva epiphytica repens, *rhizomate* elongato ramoso tereti vaginato laxe pseudobulbis obsesso polyrhizo;

radicibus filiformibus flexuosis glabris; *pseudobulbis* ovoideis 4–7 mm. long. 3·5–4 mm. crass. glabris unifoliatis; *folio* patente vel erecto-patente oblongo-elliptico obtuso glabro coriaceo 12–15 cm. long. 3·5–5 mm. lat.; *scapis* filiformibus glabris interdum folia excedentibus interdum brevioribus basi et sub medio vaginulis obsessis unifloris; *bractea* ovato-acuminata circ. 1 mm. long.; *sepalis* subæquilongis, 6 mm., 3-nervatis, sep. dorsale ovato subacuto, sep. lateralibus late ovatis breviter acutis basi ad columnæ pedem cohærentibus et mentum efformantibus; *petalis* lanceolatis, subacutis, 4 mm. long.; *labello* crasso apice columnæ pedis curvato oscillante, sub medio valde reflexo, parte inferiore ·75 mm. long. trapezoideo lateribus superne incurvatis, parte superiore linguiforme sub medio sulcato 1·2 mm. long.; *columna* breve vix ·75 mm. long. pede producto demum sursum curvato; *ovario* graciliter pedicellato clavato anguste alato.

No note of locality. 1818.

Resembles in size and habit the endemic *B. ngoyense* Schlechter, but differs in floral details.

BULBOPHYLLUM COMPTONII Rendle, sp. nov. Planta epiphytica, *pseudobulbo* oblique ovoideo 1·4 cm. l., 1·1 cm. crass. e rhizomate repente oriundo, unifoliato; *folio* petiolato, oblongo-elliptico, glabro, coriaceo, 9 cm. l. (petiolo 1·9 cm. incluso) 2·4 cm. lat.; *scapo* erecto folium excedente tenui terete glabro vaginis paucis superne acuminatis dissitis obsesso, apice paucifloro 13 cm. l., 1 mm. crass.; *bracteis* distichis arcte compressis late ovatis acuminatis glabris ovario breviter pedicellato paullo brevioribus 5 mm. l.; *flore* (unus adest) inter mediocres erecto; *sepalo dorsale* lanceolato acuminato apice carinato-incrassato 1·2 cm. l., *sep. lateralibus* e basi latiore, 5·5 mm., oblique ovatis apice falcate acuminatis carinulatis 1·2 mm. l.; *petalis* columnæ subæquilongis ligulato-oblongis apice tridenticulatis carinulatis 5 mm. l.; *labello* crasso basi concavo callis 2 instructo et lateribus elevatis tum ovato-acuminato et margine crenulato in facie superiore sulcato 11 mm. l.; *columna* erecta in pedem subæquilongum transeunte; *ovario* clavato sulcato.

No note of locality. 1790.

Recalls another endemic species, *B. pachyanthum* Schlechter, in habit and general structure, but is a smaller plant with flowers about half the size.

CIRRHOPETALUM THOUARSII Lindl. Mt. Mou; on vertical trunk; damp gully; cretaceous forest; 600 ft. 529. Lip flexible, spotted with dull dark red, petals pale. Pacific Islands.

ERIA KARIKOUYENSIS Schlechter. River Ngoyé; on wet earth in stream course; serpentine; 500 ft. 1021. Lip rose-coloured; rest of flower apricot.

PHREATIA NEOCALEDONICA Schlechter. Mt. Humboldt; epiphytic on fallen trunk by stream; forest; 1000 ft. 1032. Tonine; trees in creek-side forest; 1000 ft. 1930. Flowers white.

PHREATEA OUBATCHENSIS Schlechter. Ignambi; 1620. Tonine; 1929. Epiphyte; forest by stream; 1000 ft. Flowers ivory white. Native name, Mangaounin.

P. COMPTONII Rendle, sp. nov. (Pl. **13**. figs. 10–12.) Planta epiphytica parva, 6 cm. alta, *rhizomate* abbreviato, pseudobulbis dense obsesso; *radicibus* flexuosis glabris; *pseudobulbis* c. ·5 cm. long. ut apparet 2-foliatis; *foliis* erectis ligulatis obtusis apice inæqualiter bilobulatis basin versus paullo angustatis utrinque glabris, 5·5 cm. l., c. ·5 cm. lat.; *scapo* radicali erecto tenui glabro supra basin vaginula tum bracteis lineari-acuminatis membranaceis (7–4·5 mm. long.) instructo; *racemo* c. 20-floro 3 cm. l.; *floribus* minutis pedicellatis bracteas ovato-acuminatas excedentibus; *sep. dorsale* concavo late ovato subacuto (+1 mm. long.), *sep. lateralibus* oblique late ovatis subacutis 1·5 mm. l. anteriore conjunctis; *petalis* ovatis breviter acutis vix 1 mm. longis; *labello* sub medio late oblongo, supra medium dilatato, apice late rotundato 1 mm. l.; *columna* breve c. ·5 mm. l.

Mt. Mou; epiphyte on fallen log in moist forest; 3000 ft. 580. Flowers white. March.

Apparently near the endemic species *P. pachyphylla* Schlechter, but differs in floral details.

SPATHOGLOTTIS VIEILLARDII Rchb. f. Cap Bocage; creekside, scrub area, serpentine; 900 ft. 1395. Sepals and petals pink; lip purple and yellow. Dutch New Guinea.

S. UNGUICULATA Benth. & Hook. f. (*Limodorum unguiculatum* Labill., *S. breviscapa* Schlechter). Ignambi; gneiss; 1000 ft. 1663. Isle of Pines; *Pteridium* association, serpentine plateau; 300 ft. 2278. Flowers rosy purple; middle of lip yellow.

The specimens agree with one in Herb. Mus. Brit. labelled in Robert Brown's hand "*Limodorum unguiculatum* Labill. Sert. Austr.-Caled. p. 19, t. 25. Nova Caledonia, Labillardière." Labillardière figures and describes a small spur at the base of the lip, which spur is absent from the specimen, but otherwise the plants agree; the lip in Labillardière's figure conforms very well and shows the characteristic hairy calli at the base of the mid-lobe. *Spathoglottis Deplanchei* Rchb. f. (in Linnæa, xli. 86) is, judging from the description, also conspecific.

PHAJUS GRANDIFOLIUS Lour. Mt. Panié; Ignambi; moist spots in Niaouli region; gneiss; 1000 ft. 1800, 1800 bis. China, Australia.

P. NEOCALEDONICUS Rendle, sp. nov. (Pl. **13**. figs. 5–7.) Planta terrestris, *caule* erecto bipedale; *foliis* vaginantibus nervis valde prominentibus, singulo anguste lanceolato plurinervio, basi in partem petiolarem elongatam angustata, superne quoque angustato acuminato, lamina 17 cm. long. 6 cm. lat.; *scapo* bracteis vaginantibus tubulosis dissitis 4 cm. longis instructo superne florifero; *bracteis* florentibus caducis; *floribus* pedicellatis subpatentibus albis, labello flavo, apice roseo-tincto; *sepalis* obtusis 7-nerviis æquilongis 2·8–3·3 cm. long. 1·1–1·2 cm. lat.; sep. dorsale late oblanceolato; sep. lateralibus subobliquе elliptico-oblongis; *petalis* oblanceolato-ligulatis apice pæne truncatis 5-nerviis 2·6–2·8 cm. l., ·7 cm. lat.; *labello* convoluto antice trilobo, lobis lateralibus obtuse triangularibus, intermedio breviter orbiculare retuso, carinis 2 parallelis medianis e basi in apicem vix apiculatam decurrentibus, 2·6–2·8 cm. longo, calcare nullo; *columna* 2 cm. longa facie concava superne ampliata et alata.

Mt. Arago; frequent in some parts of moist forest; schists. 1408. Leaves dark green, nerves prominent making sheaths and stem ridged. Flowers, ovary and pedicel white; lip creamy yellow with faint rosy patches outside mouth.

Apparently allied to the endemic *Phajus Robertsii* F. Muell., which I have not seen, but differing in colour of flower and details of size and shape of floral leaves. Is also near the Malayan *P. amboinensis* Bl., collected by Banks and Solander in Otaheite, but has larger flowers.

Phajus flavus Lindl. Mt. Mou; Conifer forest, on fallen log; 3500 ft. 498. Flowers yellow; lip with brown folded edges. A small form of this Malayan species.

Earina Deplanchei Rchb. f. Mts. north of Ngoyé; abundant in dry scrub; serpentine; 1000–3000 ft. 2072. Flowers shiny green, transparent, lip rather lighter.

E. valida Rchb. f. Mt. Mou; epiphyte; serpentine forest; 2500 ft. 568. Ignambi; on branches in forest; 2000–4000 ft. 1691. Taom; terrestrial; frequent in upland serpentine scrub; among rocks; 3000 ft. 2326. Flowers white, slightly fleshy, scentless.

Calanthe angræciflora Rchb. f. Ermitage stream; serpentine; 300 ft. 205. Mt. Canala; forest; schists; 1000 ft. 1152.

C. Langei F. Muell. Mt. Arago; 1500 ft. 1435. Ignambi; gneiss; 1000–2500 ft. 1682. On logs in moist forest. Flowers orange-yellow with pale transparent spurs.

C. oreadum Rendle, sp. nov. (Pl. **13**. fig. 9.) Planta terrestris glaber; *foliis* magnis lanceolatis, basi in vaginam angustatis superne acuminatis plicato-venosis, venis primariis conspicue prominentibus 5, lamina specimine 6 dm. long. 7·5 cm. lat.; *scapo* erecto tereti valido, folio breviore, 1½–2-pedale, bracteis vaginantibus tubulosis dissitis 3·5–3 cm. longis prædito, superne sublaxe florifero; bracteis florentibus obsoletis; *floribus* sine aroma erecto-patentibus semiapertis, pedicellis gracilibus c. 1 cm. long.; perianthii segmentis albidis apice viridescentibus; *sep. dorsale* concavo obovato apice subacuto apiculato 3-nervio 9 mm. long. c. ·5 mm. lat.; *sep. lateralibus* oblique elliptico-obovatis apice subacutis 3-nerviis 1 cm. long. ·5 cm. lat.; *petalis* obovatis obtusis obsolete apiculatis 5-nerviis vix 1 cm. long. ·6 cm. lat.; *labelli* parte inferiore columnæ adnato, parte superiore libero vix 5 mm. long. 3-lobo, lobis lateralibus parvis suberectis breviter ovatis 2–2·5 mm. long., lobo intermedio subquadrato 3·5 mm. lat. apice bilobulato, lobulis rotundatis medio apiculato; *calcare* pro flore magno sacciformi compresso obtuso 8 mm. long. pæne 5 mm. lat., ore callo crasso sub labelli basi ornato; *columna* 5·5 mm. long.

Mt. Canala; moist forests; schists; 2000 ft. 1239. Mt. Arago; logs in damp forest; 1500 ft. 1436. Mt. Panié; moist forest; gneiss; 1500 ft. 1761.

Near the endemic species *C. Balansæ* Finet, but differs in floral details, especially in the form of the lip.

CALANTHE NEOCALEDONICA Rendle, sp. nov. (Pl. **13**. fig. 8.) Planta terrestris, *caule* tumido, radicibus pluribus velutino-pilosis instructo; *foliis* glabris pluribus radicalibus magnis anguste lanceolatis basi in vaginam angustatis apice acutis plicato-venosis, venis primariis conspicuis 5, lamina specimine ad 5·5 dm. long. 7 cm. lat.; *scapo* 3-pedale laterali subvalido tereti glabro, *bracteis* 3–4 vaginantibus nigrescentibus æqualiter dissitis 3–4·5 cm. l. prædito; *racemo* multifloro specimine 25 cm. long., bracteis florentibus obsoletis; *floribus* albis patentibus inter mediocres graciliter pedicellatis; *sep. dorsale* obovato-elliptico apice breviter acuminato 5-nervio 12 mm. long. 8 mm. lat.; *sep. lateralibus* elliptico-oblongis apice breviter et falcate acuminatis 5-nerviis 12·5 mm. long. 6·5 mm. lat.; *petalis* concavis late elliptico-obovatis, apice vix vel breviter acutis, 7-nerviis 12 mm. long. 8 mm. lat.; *labelli* parte inferiore columnæ adnato, parte superiore libero 7·5 mm. longo 3-lobo, lobis lateralibus brevibus suborbiculari-ovatis obtusis 2·5 mm. longis, lobo intermedio lato margine crispulo apice retuso 5 mm. longo 5·5 mm. lato; *calcare* pro flore magno crasso curvato 7 mm. longo obtuso; *columna* brevi (6·5 mm. long.) crassa margine superiore denticulata; *ovario* cum pedicello 2 cm. longo.

Mt. Arago; moist forests; schists; 1000 ft. 1409. Ignambi; forest; gneiss; 1000–3000 ft. 1609. Flowers white tinged with yellow when old, with a waxy appearance.

Near the last species, but differs in floral details and especially in the longer curving lip.

GEODORUM PICTUM Lindl. Mt. Mou; lowland forest; 700 ft. 439. Flowers dingy pink.

DIPODIUM SQUAMATUM R. Br. Tonghoué Mts.; 1000 ft. 163. Mt. Mou; cretaceous; 800 ft. 530. Ignambi; gneiss; 100 ft. 1661. Oubatche;

gneiss; 200 ft. 1837. Niaouli association. Flowers white tinged with rose on inside of segments and lip; scentless.

LUISIA TERETIFOLIA Gaud. Anse de la Mission, Nouméa; on tree-trunks near sea and in mangrove swamps. 420. Lip deep purple-brown, velvety; other perianth-segments greenish, tinged with brown.

SARCOCHILUS NEOCALEDONICUS Rendle, sp. nov. Planta epiphytica, *caule* repente 2 mm. crass. radicibus elongatis flexuosis cinereis glabris prædito et vaginis foliorum persistentibus obtecto; *foliis* ligulatis apice obtusis et oblique emarginatis crassiusculis glabris 4–5 cm. long. 7–8 mm. lat.; *racemis* pendentibus foliis subæquilongis, ut apparet c. 15-floris; *bracteis* parvulis, ovato-deltoideis, 1 mm. long.; *floribus* parvis, glabris; *sep. lateralibus* ligulato-oblongis obtusis 1-nerviis concavis 5 mm. long.; *sep. dorsale* latiore et magis concavo; *petalis* lineari-ligulatis superne vix latioribus obtusis 1-nerviis sepala vix æquantibus; *labello* valde unguiculato ungue complanato crasso 1·5 mm. long., superne subito reflexo et 3-lobato c. 2 mm. long., lobis lateralibus oblique triangularibus quoque in apicem tenuem curvatum excurrente, lobo intermedio parvo sacciforme, disco callis binis parallelis medianis instructo; *columna* breve crassa 1 mm. long., ejus pede c. 1·5 long.

Ignambi; forest; 1000 ft. 1621. Flowers orange-yellow; lip with two fine upwardly directed points. Aug.

Apparently near the other endemic species, *S. rarum* Schlechter and *S. koghiensis* Schlechter, but distinguished by floral details, especially of the lip.

MICROTATORCHIS FASCIOLA Schlechter. Ignambi; forest; 3000 ft. 1569, 1653. Tonine; forest; 3300 ft. 1985. On tree-trunks among mosses, clinging by flat green ribbon-like roots; flowers transparent green fading to yellow.

PODOCHILUS VIEILLARDII Schlechter. Poume; on bare rocks with very little humus, in scrubby wood; serpentine; 1300 ft. 237. Flowers white, delicate.

ERIAXIS RIGIDA Rchb. f. River Comboui; terrestrial; very abundant in serpentine scrub (and also on gneiss and in light woods). 2210. Flowers one or two open at a time, lasting one day; lip white in centre with lateral blotches of purple and yellow hairs within, other perianth-segments white; slight scent; usually eaten by beetles.

SPIRANTHES AUSTRALIS Lindl. Ignambi; Niaouli-Pteridium-Gleichenia association; 1000 and 2000 ft.; gneiss. 1493, 1849. Mt. Panié; forest-clearing; gneiss; 1500 ft. 1830. Australia, New Zealand, temperate and tropical Asia.

ANŒCTOCHILUS IMITANS Schlechter (e descript.). Ignambi; terrestrial; moist forest; 2000 ft. 1844. Leaves dark bronze-green, velvety with light veining; bracts tinged red; calyx greenish, red tinge; lip white.

A. MONTANUS Schlechter (e descript.). Mt. Canala; abundant in dense shade of forest; schist clay; 2000 ft. 1109. Flowers pure white. Also specimen from Pancher, "Sous les forêts; alt. 600 mètres." The plants vary in size, becoming much larger than described; the stem in the largest specimen is nearly 25 cm. long, and the leaves 5·5 cm. in length by 2·5 cm. in breadth. New Hebrides.

ZEUXINE VIEILLARDII Benth. & Hook. f. (*Monochilus Vieillardii* Rchb. f.). Paompai; humus of creekside woods; shales; 50 ft. 1900. Rhizome creeping, erect stem fleshy, green, leaves about 4, soft dark green, horizontal; lip white with orange blotch in throat, petals tinged with pink.

RHAMPHIDIA VIEILLARDII Rchb. f. R. Ngoyé; serpentine; 400 ft. 2114. Comboui Mts.; serpentine; 1000 ft. 2205. Humus in *Spermolepis* forest. Rhizome elongated, creeping among humus and leaves; leaves green, variegated above with dark or light green pattern; spike erect, 1–2 ft., very brittle; corolla white with slight blotches of yellow, tip of column dark. Oct.

R. RUBICUNDA Rchb. f. Isle of Pines (Ouro); frequent in coral forest; 50 ft. 2260. Corolla dull whitish-brown; spike erect. Fiji Is., Loyalty Is.

R. SCRIPTA Rchb. f. Ignambi; humus in forest; gneiss; 1500 ft. 1675. Mt. Panié; forest; gneiss; 1200 ft. 1834. Long underground stem with elongated tubers at intervals; flowers yellowish brown.

THELYMITRA LONGIFOLIA Forst. Ignambi; abundant on ground in forest-clearings; gneiss; 2000 ft. 1857. Tonine; open spaces in forest and among *Pteridium* and *Gleichenia*; 2000–3000 ft. 1946. Perianth pink, becoming purplish. Australia.

MICROTIS PARVIFLORA R. Br. Ignambi; occasional in Niaouli-Gleichenia association; gneiss; 2000 ft. 1492. Australia, Indian Archipelago, S. China.

PTEROSTYLIS ACUMINATA R. Br. Mt. Canala; Niaouli-grass association; schists; 1500 ft. 1275. New South Wales.

P. CURTA R. Br. Mt. Panié; on earth among rocks in forest; gneiss; 4000 ft. 1817. Australia.

P. NEOCALEDONICA Schlechter. Ignambi; moist forest; gneiss; 3000 ft. 1511. Flowers greenish-veined.

PTEROSTYLIS OPHIOGLOSSA R. Br. Mt. Canala; Niaouli-grass association; schists; 1500 ft. 1275 bis. Eastern Australia.

CORYSANTHES NEOCALEDONICA Schlechter. Mt. Mou; bare hills; serpentine; 2000 ft. 1291. Flower purplish.

ACIANTHUS ELEGANS Rchb. f. Nekando; *Spermolepis-Agathis* forest; serpentine; 1000 ft. 980. Stem reddish; single leaf green above, dark purplish below; flowers green; column with red tip.

A. NANUS Rendle, sp. nov. (Pl. **13**. fig. 3.) Planta terrestris glabra 7 cm. alta; *caule* e tubere parvo rotundo erecto, medio unifoliato, bifloro; *folio* circuitu orbiculare diam. 2·2 cm. basi cordato, 5-lobo lobis rotundatis apiculatis; *bracteis* ovatis acutis pedicellos excedentibus 6–8 mm. long.; *sepalis* anguste lineari-acuminatis apice obtusiusculis, dorsale 1·7 cm., lateralibus 1·4 cm. long.; *petalis* oblique oblongo-ellipticis superne falcato-acuminatis apice caudatis 3 nerviis, 1·1 cm. long.; *labello* 1·4 cm. long., parte inferiore ligulato supra medium dilatato, apice 3 mm. lato 3-lobo, lobis lateralibus obscuris rotundatis, lobo medio angusto acuto 3·5 mm. long., basi 2-auriculato; *columna* supra medium curvata, in margine anteriore alata, ala apice et medio ampliata.

Ignambi; rather rare in moist forest; gneiss; 2500–3500 ft. 1700. Flowers greenish white tinged with purple. Aug. Near *A. cymbalariæfolius* F. Muell. & Kränzl., but differs in the shape of the lip and other floral details.

A. CULICIFERUS Rendle, sp. nov. (Pl. **13**. fig. 4.) Planta terrestris glabra circa 2·5 dm. alt.; *caule* e tubere ut apparet pisiforme erecto pergracile flexuoso medio unifoliato laxiter 4–5-floro; *folio* ·5–1 cm. longo 4-partito, segmentis ellipticis apiculatis; *bracteis* ovatis acutis 2·3–3 mm. long. pedicellos breves paullo excedentibus; *sepalis* anguste linearibus sub apice angustatis, dorsale 9–11 mm. long., lateralibus paullo brevioribus; *petalis* oblique elliptico-oblongis subito acuminatis, 1-nerviis, 4–5 mm. long.; *labello* e basi cordato 1·5 mm. lat. angustato acuminato 7 mm. long.; *columna* tenue sub apice curvata 4 mm. long.

River Ngoyé; among dead leaves, twigs, and humus in *Casuarina* forest near river; serpentine; 300 ft. 1023. May.

Allied to *A. tenuilabris* Schlechter, which I have not seen, but differing in the longer sepals and shape of lip.

A. BRACTEATUS Rendle, sp. nov. (Pl. **13**. fig. 1.) Planta terrestris glabra 10–15 cm. alt.; *caule* e tubere pisiforme erecto tereti veluti foliis rubro tincto supra medium unifoliato 3–4-floro; *folio* 5-partito, segmentis oblongo-ellipticis vel obovatis apiculatis usque ad 1·2 cm. long.; *bracteis* inter congeneres magnis foliaceis elliptico-obovatis apiculatis 1–1·7 cm. long. pedicellum et ovarium superantibus; *floribus* atrorubris; *sepalis* anguste

lineari-oblanceolatis superne caudatis 1-nerviis 1 cm. long.; *labello* glabro 1·2 cm. long. e basi late lineari 3 mm. long. subito extenso superne dilatato et 4 mm. lato demum 3-lobato, lobis triangulari-acuminatis, lateralibus 2 mm. long., lobo medio 4·5 mm. long.; *columna* gracile ·5 cm. long. medio geniculata et in facie anteriore appendice cordato-acuminata depressa instructa, supra medium incurvata; *ovario* cum pedicello brevi usque ad 1 cm. long.

Mt. Mou; cloud forest; serpentine; 3500 ft. 631. Flowers dull, dark red.

This and the next species are characterized by an appendage about the middle of the anterior face of the column; a character which has not, to my knowledge, been hitherto noted in the genus.

ACIANTHUS CORNICULATUS Rendle, sp. nov. (Pl. **13.** fig. 2.) Planta terrestris glabra 6–16 cm. alt.; *caule* erecto tereti medio vel supra unifoliato 2-floro; *folio* ut in *A. bracteato*; *bracteis* parvis late ovato-acutis pedicellum vix excedentibus 2–2·5 mm. long.; *sepalis* linearibus sub apice acuto angustatis, dorsale 8·5 mm. long., lateralibus vix 7 mm.; *petalis* oblique ellipticis obtusis 4·5 mm. long.; *labello* glabro 5·5 mm. long. e basi angusta biauriculata dilatato superne 3 mm. lat. et 3-lobato, lobis lateralibus brevibus rotundatis, lobo medio ovato-triangulare subacuto; *columna* gracile 4 mm. long. medio geniculata et in facie anteriore appendice erecta bicorniculata instructa, supra medium incurvata; *ovario* cylindrico 6·5 mm. long.

Ignambi; moist forest; gneiss; 3000 ft. 1712. Plant with much anthocyan throughout. Aug. Flowers smaller than in the last species, and the subtending bract inconspicuous.

LYPERANTHUS GIGAS Schlechter. Plaine des Lacs; edge of pools on flood plain; serpentine; 800 ft. 345. R. Comboui; serpentine scrub; 50 ft. 2011. Flowers ivory white, upper face of lip purple. Feb., Oct.

L. GLANDULOSUS Schlechter. R. Comboui; forest humus; serpentine; 600 ft. 2204. Taom; upland serpentine scrub; 3000 ft.; rare. 2325. Flowers leaf-green, scentless. Oct., Dec.

L. LATILABRIS Schlechter. Mt. Koghi; open dry serpentine scrub; 2000 ft. 733. Nekando; serpentine scrub; 3000 ft. 2123. Flowers green except for tinge of pink at tip of labellum; sweet-scented. Apr., Oct.

CALADENIA ALBA R. Br. Mt. Arago; Niaouli-Gleichenia-Pteridium association; schists; 1500 ft. 1449. Ignambi; Niaouli association; gneiss; 1500 ft. 1662. Flowers white, lip streaked with purple and tipped with yellow; scentless. Australia.

AMARYLLIDACÆ.

CRINUM ASIATICUM L. Île Porc Épic; just above high tide-mark. 913. Trop. Asia, Australia.

CAMPYNEMANTHE VIRIDFLORA Baill. Mt. Mou, Mt. Koghi; serpentine forest; 2500 & 3000 ft. 573, 729.

CAMPYNEMA NEOCALEDONICUM Rendle, sp. nov. (Pl. **14**.) *Herba* perennis 12–30 cm. alt., *rhizomate* brevi radicibus filiformibus et fibris diu persistentibus cum vaginis membranaceis foliorum marcescentium dense obsito; *foliis* plurimis equitantibus erectis e basi latiore vaginante linearibus, versus apicem tridenticulatum angustatis, carnosulis, 1–3 dm. long. 3–7 mm. lat.; *scapo* laterale erecto compresso rigido marginibus leviter alato, foliis breviore, *bracteis* 3, e basi latiore et vaginante attenuatis membranaceis longitudine instructo; *floribus* 2-plurimis (ad 16) longe pedicellatis protandris in scapi apice, flore terminali et cymis 1–3 unilateralibus; *pedicellis* compressis leviter alatis rigidis 2·5–4 cm. long.; *bracteis* lineari-lanceolatis acuminatis pedicellis 2–4-plo brevioribus; *perianthii segmentis* crassiusculis viridibus, in facie superiore brunneo-purpureis, ellipticis subacutis, 8 mm. long., 3 interioribus paullo angustioribus, 3 exterioribus in ovarium decurrentibus; *staminibus* perianthio brevioribus, antheris dorsifixis introrsis 1·3 mm. long., connectivo leviter umbonato, filamentis persistentibus 1·3 mm. long.; *stylo* brevi columnari medio in ramis 3 in facie superiore stigmatosis demum recurvatis diviso, 2·5 mm. long.; *fructu* turbinato 5–6 mm. long., pericarpio inter alas 3 rigidas tenuiter membranaceo seminum formam patefaciente; *seminibus* numerosis aggregatis pyriformi-angulatis in funiculo pendulis; testa tenui rubro-brunnea sparsius maculata.

Ignambi; forest; 3500 ft. 1575. Mt. Panié; moist clayey soil in forest; gneiss; 1500 ft., 1782; and 4000 ft., 1811. Flowers scentless; perianth green outside, deep brown-purple inside.

An interesting addition to the genus which has hitherto been known only from Tasmania, where it is represented by one (or two) species. The New Caledonian species is more leafy and floriferous than the Tasmanian, in which, moreover, the anthers are described as extrorse and the styles free to the base.

DIOSCOREACEÆ.

DIOSCOREA BULBIFERA L. Mt. Mou; frequent in old cultivation areas; serpentine; 800 ft. 507. Introduced.

LILIACEÆ.

SMILAX PURPURATA Forst. Mt. Mou; moist forest; cretaceous; 800 ft. 505. Mt. Humboldt; streamside forest; serpentine; 1000 ft. 1038. River Tchiem; sea-level. 1996.

Var. CONCOLOR A. DC. Dumbéa; serpentine scrub; 100 ft. 412. Kuakué; flood plain of river; serpentine; 50 ft. 903, 903 *a*. Ignambi; intermediate forest; 3500 ft. 1707.

S. VITIENSIS A. DC. Tonine; forest margin; 1500 ft. 1951, 1957. Fiji Is.

SMILAX ORBICULATA Labill., var. BALANSÆ A. DC. Taom; serpentine scrub; 2500 ft. 2334. Mt. Koghi; forest margin; serpentine; 1500 ft. 790.

GEITONOPLESIUM CYMOSUM Cunn. Nouméa. 63. Paompai; forest margin; shales; 0–2000 ft. 1870. Taom; creekside forest; serpentine; 300 ft. 2339. Isle of Pines; coral forest; abundant. 2255. Australia.

LOMANDRA INSULARIS Schlechter. Mont Dore; 2000 ft.; 687; Cap Bocage; 800 ft.; 1393; Poume; 1200 ft.; 2378; all on serpentine scrub.

CORDYLINE TERMINALIS Kunth. Baie Kuakué; stream-valley woods near shore; serpentine. 891. Trop. Asia, Australia, Polynesia.

C. NEOCALEDONICA Linden (*Cohnia neocaledonica* Baker). River Comboui; alluvium scrub; serpentine; 400 ft. 2218. Plaine des Lacs; 800 ft. 380.

ASTELIA NEOCALEDONICA Schlechter. Mt. Mou; epiphyte; cloud forest; 3800 ft. 489. Mt. Humboldt; on ground and sloping trunks and branches in wet forest; 2000 ft. 1022.

XERONEMA MOOREI Brongn. & Gris. Mt. Koghi; on rocks; scrub association; serpentine; 2500 ft. 732.

ARTHROPODIUM NEOCALEDONICUM Baker. Mt. Mou; rocks by stream in forest; cretaceous; 500 ft. 531.

DIANELLA REVOLUTA R. Br. Ignambi; Niaouli association; gneiss; 1000 ft. 1601. Australia.

D. ENSIFOLIA Red. Comboui Mts; scrubby woods; serpentine; 2500 ft. 2186. Trop. Asia, Mascarene and Pacific Is., Australia.

D. AUSTROCALEDONICA Seem. Mt. Mou; cretaceous; 800 ft. 503. Baie Bâ; alluvium; sea-level. 1389. Moist part of Niaouli region.

PONTEDERIACEÆ.

EICHORNIA CRASSIPES Solms. Oubatche; floating in streams and ditches. 1602. South America. Introduced.

XYRIDACEÆ.

XYRIS NEOCALEDONICA Rendle. Nekando; open serpentine scrub; 1000 ft. 2117.

X. PANCHERI Rendle. Plaine des Lacs; abundant in flood plain and edges of permanent pools; serpentine; 800 ft. 342.

COMMELINACEÆ.

ANEILEMA NEOCALEDONICUM Schlechter. Mt. Mou; cretaceous; 1000 ft. 467. Tonine; 500 ft. 1955. Streamsides in forest.

FLAGELLARIACEÆ.

Flagellaria neocaledonica Schlechter. R. Comboui; alluvial serpentine scrub; 0–500 ft. 2173.

Joinvillea elegans Gaud. Mt. Canala; forest margin; schists; 1500 ft. 1127. Mt. Mou; damp gully forests; cretaceous; 600 ft. 557.

JUNCACEÆ.

Juncus pauciflorus R. Br. Tonghoué Mts. 166. Australasia, East Asia.

PALMACEÆ.

Microkentia eriostachys Benth. & Hook. f. Mt. Mou; conifer forest; 3500 ft. 491.

PANDANACEÆ.

Pandanus odoratissimus Linn. f. Baie Ouémo, Nouméa; along littoral. 239. South Asia, Australia, islands of Indian and Pacific Oceans.

Freycinetia (Sect. Pleiostigma) **Comptonii** Rendle, sp. nov. *Frutex* radicibus scandens; *ramulis* florentibus specimine singulo 8 mm. crass., internodiis brevibus; *foliis* in apice ramuli confertis basi brevissime vaginantibus siccis pergamentaceis elongato-obovato-oblongis abrupte cuspidato-acuminatis, submedio attenuatis, circiter 40-nerviis, marginibus præsertim in apice et secus costam in pagina inferiore aculeis minutis instructis, ad 35 cm. long. 7 cm. lat.; *inflorescentia* terminale fœminea, bracteis brunneis ovato-acutis 5 cm. longis sub medio circumdata; *pedicellis* validis subcompressis glabris circ. 4 cm. long. 4 mm. lat.; *syncarpiis* 4, anguste oblongo cylindricis atrato-viridibus, 4·5–5·5 cm. long. 7–9 mm. crass.; *carpidiis* dense aggregatis, prismaticis 2·5 mm. long. 3–4 mm. lat., basi staminodiis brevibus circumdatis, parte superiore 1 mm. long. truncato-pyramidata libera; *stigmatibus* 4–7 distinctis, siccis pallide brunneis.

Paompai; creekside woods; shales; 50 ft. 1909.

Recalls *F. marantifolia* Hemsl. from the Solomon Is. in appearance, but the leaves and spikes are longer and proportionately narrower.

F. graminifolia Solms. Mt. Mou; moist valleys; cretaceous; 800 ft. 513. Mt. Arago; on trees and rocks in wet forest; schists; 1000 ft. 1406. Mt. Panié; forest; gneiss; 1200 ft. 1793. Paompai; forest; 0–1000 ft.; creeksides; shales. 1888.

F. microdonta Martelli. Ermitage Stream; forest at 300 ft.; serpentine. 159. Mt. Mou; serpentine forest; 1500 ft. 453. Mt. Canala; moist forest; schists; 3000 ft. 1240. Ignambi; forest; gneiss; 3500 ft. 1543.

FREYCINETIA MONTICOLA Rendle, sp. nov. *Frutex* radicibus scandens; *ramis* elongatis pendulis, specimine subtrigonis rubicundis, internodiis brevibus usque ad 6–7 mm. long.; *foliis* e basi angusta contorta lineari-lanceolatis acutis, 16–18-nerviis, marginibus et secus costam in pagina inferiore frequentius aculeis minutis instructis, 8·5–14·5 cm. long. 1·7–2·2 cm. lat.; *inflorescentia* in ramulo brevi bracteis angustis recurvatis dense induto 1 cm. long.; *pedicellis* subvalidis 2·5–3 cm. long. vix 2 mm. crass.; *syncarpiis* 3 elliptico-oblongis 2–3·5 cm. long. usque ad 1·5 cm. lat.; *carpidiis* aggregatis subellipsoideis supra medium liberis apice subcylindricis, 4 mm. long., basi staminodiis brevibus paucis circumdatis; *stigmatibus* 3–4, subconicis, siccis læte brunneis.

Mt. Panié ; forest; gneiss ; 1500 ft. 1760.

Recalls the Fijian species *F. caudata* Hemsl., which, however, has leaves with a longer, narrow sheathing base and longer, narrower spikes.

F. SCHLECHTERI Warb. Tonine ; forest ; hornblende ; 2000 ft. 1948. Bracts fleshy purple or white.

TYPHACEÆ.

TYPHA ANGUSTIFOLIA L. Anse Vata, Nouméa; freshwater swamp. 78. Widely distributed.

ARACEÆ.

EPIPREMNUM PINNATUM Engl. Mt. Arago ; moist forests and along streams; schists ; 1000 ft. 1421. Malaya to Australia and Polynesia.

AMORPHOPHALLUS cf. CAMPANULATUS Bl. Baie Kuakué; stream valley forest near shore ; serpentine. 892. A single leaf.

POTAMOGETONACEÆ.

POTAMOGETON OWAIHIENSIS Cham. & Schlecht. R. Tchiem ; 500 ft. 1987. (Det. A. Bennett.) Sandwich Is.

ERIOCAULACEÆ.

ERIOCAULON COMPTONII Rendle, sp. nov. *Herba* parva submersa in limo radicans glabra acaulis; *foliis* rosulatis e basi paullo dilatata lineari-ensiformibus acuminatis 7–11-fenestrato-nerviis membranaceis planis 5–13 cm. long. 1·5–3 mm. lat.; *pedunculo* solitario stricto 6-costato, 14·5–16 cm. long., basi vagina apice fissa c. 2·5 cm. long. circumdato; *capitulo* subgloboso albido-villoso, c. 5 mm. diam.; *bracteis involucrantibus* suborbicularibus glabris membranaceis capitulo plus duplo brevioribus; *bracteis florentibus* obovato-cuneatis vel obovato-trapezoideis concavis apice truncatis et erosis, versus apicem dorso albido-pilosis, 2·75 mm. long.; *flore masculo*: sepalis 3 spathulatis obtusis dorso sub apice breviter niveo-piloso 2 mm. long.; *petalis* in tubum, apice in lobos 3 ciliolatos glandula fusca parva instructos divisum, connatis; *antheris* 6 nigris; *flore fœmineo*: *sepalis* 3 ovatis acutis valde carinatis, dorso pilosis 2 mm. long.; *petalis* 3 oblanceolatis, apice pilosis et glandula fusca ornatis; sepalis paullo longioribus; *stigmatibus* filiformibus.

Plaine des Lacs; submerged in streams and marshes; serpentine; 800 ft. 368. Feb.

Near *E. neocaledonica* Schlechter, but apparently a larger plant with smaller heads, and differing in the form of the floral bracts and sepals. The leaves and peduncle are covered with diatoms and the threads of a *Cladophora*, giving the appearance of hairiness.

CYPERACEÆ.

PYCREUS POLYSTACHYUS Beauv. Nouméa; roadside ditches. 31. R. Dumbéa; moist places, ditches, and wet pastures; serpentine; 50 ft. 403. Widely distributed.

Var. LAXIFLORA Benth. Monac; edge of freshwater pool; 50 ft. 2354. Widely distributed.

MARISCUS CYPERINUS Vahl, var. VENUSTUS C. B. Clarke (*Cyperus venustus* Forst.). Dumbéa; abundant in moist pastures and ditches; serpentine; 50 ft. 406. Polynesia.

CYPERUS ROTUNDUS L. Nouméa; roadside ditches. 220. Widely distributed.

KYLLINGA BREVIFOLIA Rottb. Nouméa; roadside ditches. 34. Widely distributed.

K. MONOCEPHALA Rottb. Ignambi; forest-path; gneiss; 2000–3500 ft. 1570. Widely distributed.

ELEOCHARIS PLANTAGINEA R. Br. Anse Vata, Nouméa; freshwater swamps, sea-level. 79. Old World tropics.

FIMBRISTYLIS ÆSTIVALIS Vahl. Monac; edge of freshwater pool; 50 ft. 2355. Widely distributed.

F. COMPLANATA Link. Taom; stream banks; serpentine; 2000 ft. 2289. All warm regions.

F. DIPHYLLA Vahl. Nouméa; roadside ditches. 95. Dumbéa; abundant in moist places. 405. All warm regions.

F. FERRUGINEA Vahl. Port Ngea, Nouméa; margin of salt-marsh. 4. Nouméa; wet ditches in town. 38. All warm regions.

Abildgaardia monostachya Vahl. Mt. Dore; common in grassland in old guava cultivation; serpentine. 100 ft. 663.

Scirpus mucronatus L. Tonghoué Mts.; streamside in open pasture; cretaceous; 1000 ft. 167. Mt. Mou; swamp, margin of cultivation; serpentine; 1000 ft. 474. Widely distributed in Old World.

Chorizandra cymbaria R. Br. R. Comboui; marshy places by river; serpentine alluvium; 300 ft. 2214. Australia.

Rhynchospora glauca Vahl. Tonghoué Mts.; moist muddy streambanks. 168. Warm regions.

Schœnus brevifolius R. Br. Plaine des Lacs; abundant on level plain and up dry slopes, serpentine scrub and light woods. 398. Australia and New Zealand.

S. neocaledonica C. B. Clarke. R. Comboui; moister parts of serpentine alluvium; 500 ft. 2223.

S. Tendo Hook. f. Cap Bocage; frequent in dense serpentine scrub; 500 ft. 1379. New Zealand.

Lophoschœnus arundinaceus Stapf (*Schœnus arundinaceus* Forst.). Presqu'île Bogota; very abundant in dry serpentine scrub up to 3500 ft. 1343.

L. comosus Stapf (*Schœnus comosus* C. B. Clarke). Baie Ngo; abundant along streams in serpentine scrub; 300 ft. 255.

Costularia neocaledonica Rendle, sp. nov. *Herba* glabra cæspitosa erecta 4-pedalis, rhizomate brevi crassa vaginis marcescentibus induta et radices filiformes emittente, apice folia pauca basi vaginis scariosis 5 inclusa et culmum gerente; *vaginis* latis 1·5–14 cm. long., apice lamina brevi usque ad 1·5 cm. long. instructis; *foliis* 3–4 elongatis suberectis rigidulis e vagina scariosa linearibus obtusis in facie superiore venis prominentibus lineatis margine subito et anguste reflexa, plicæ margine scabrido, ad 6 dm. long. et 3·5–4·5 mm. lat.; *culmo* 13 dm. long. rigidulo complanato striato sub medio 2-nodo et folia 3·4 dm. et 1·2 dm. long. gerente, supra medium graciliore et paniculam laxam 4·5 dm. long. eleganter nutantem efformante; *bracteis* foliaceis duabus inferioribus 6·5 et 4·5 cm. longis; *inflorescentiæ* ramis distantibus elongatis filiformibus, sparsifloris; *spiculis* pedicellatis anguste lanceolatis colore rubro-brunneo tinctis c. 8 mm. longis; *glumis* distichis dorso rotundatis, apice obscure 3-denticulatis, 6–8 inferioribus vacuis, 2 supremis florentibus majoribus 5·5–6·5 mm. long., flore inferiore masculo ovario rudimentario, fl. superiore bisexuali; *rhachilla* flexuosa nec inter neque supra flores elongata sed gluma binervi palæacea florem bisexualem tegente terminata; *setis hypogynis* 6, elongatis anguste linearibus, ciliatis, 5 mm. long.; *antheris* cum connectivo apiculato 3 mm. long.; *stylo* sub-medio 3-ramo; nuce. . . .

Mts. north of Ngoyé; *Casuarina* forest; serpentine; 2500 ft. 2066. Nekando; conifer forest; serpentine; 3500 ft. 2066*a*.

A remarkable plant which is perhaps congeneric with the next species. It is very different in appearance from any of the species grouped in *Costularia* by Clarke, and may perhaps represent a new genus. Unfortunately the material contains no fruit.

COSTULARIA PALUDOSA C. B. Clarke (*Tricostularia paludosa* Benth.). Plaine des Lacs; covering small areas on serpentine alluvium, moist parts; 800 ft. 369. Eastern Australia.

CLADIUM DEPLANCHEI C. B. Clarke. Baie Ngo; moist places in flood plain; serpentine; 200 ft. 246. Plaine des Lacs; common on serpentine hillside; 1000 ft. 363.

C. GLOMERATUM R. Br. Ignambi; wet spots in Niaouli association; gneiss; 1000–2000 ft. 1670.

SCLERIA DEPAUPERATA Boeckl. Nouméa; Port Déspointes woods. 238.

S. MARGARITIFERA Willd. Ermitage Stream; streamside among pebbles; serpentine; 300 ft. 208. Polynesia, Australia.

S. NEOCALEDONICA Rendle, sp. nov. *Herba* 6·5 dm. alta, rhizomate horizontale brevi lignoso perennis; *culmo* erecto rigido multifoliato acute trigono glabrescente rufescente medio 2·5 mm. crasso, super basin 8-nodo; *foliis* 4 in parte culmi inferiore confertis, in parte florifera gradatim deminutis (sed culmum excedentibus) et in bracteas transgredientibus, erecto-patentibus, rigidulis lineari-acuminatis planiusculis, margine scabridulo et nervo mediano in facie inferiore prominente breviter pilosis usque ad 6·5 dm. long. et 8·5 mm. lat., vaginis pubescentibus rufescentibus, ea folii mediani 5 cm. long.; *paniculis* axillariis (cum singula terminali) densis spiciformibus brevibus usque ad 3 cm. long.; bracteis foliaceis; *spiculis* c. 7 mm. long. in ramulis brevibus paniculæ sessilibus binatis vel solitariis monœcis subfusco-rufescentibus; *bracteis* subtendentibus e basi lata anguste lineari-acuminata spiculam excedentibus vel subæquantibus; *squamis* ovatis mucronatis; *flore* inferiore fœmineo, superioribus paucis masculis; *staminibus* 3; *nuce* oblonga obsolete trigona breviter rostrata albida, pilis minutis læte-brunneis aggregatis hirtella, 3 mm. long.; *disco* breviter cupuliformi margine integro.

R. Ngoyé; among rocks by river; serpentine; 400 ft. 2047. A very distinct species characterized by the short dense axillary panicles.

Carex Dietrichiæ Boeckl. Ermitage Stream; streamside among stones; serpentine; 300 ft. 197.

C. maculata Boott, var. neurochlamys Kukenth. Mt. Mou; freshwater swamp, margin of cultivation; serpentine; 1000 ft. 472. Ignambi; moist shady forest; gneiss; 2000 and 3000 ft. 1510, 1856.

GRAMINEÆ.

Leptaspis umbrosa Bal. Ermitage stream; forest; serpentine; 300 ft. 206.

Greslania circinata Bal. Nekando; abundant in conifer forest and upland serpentine scrub; 3000–4000 ft. 1080.

Besides the above two endemic grasses, the collection contains the following species, which are more or less generally distributed in warm countries:—

Paspalum scrobiculatum L. Ermitage Stream. 207. Ignambi; 3500 ft. 1558.

Digitaria sanguinalis Scop. Ermitage Stream. 147.

Panicum colonum L. Nouméa. 85.

Oplismenus compositus Beauv. Ignambi; 2000–3000 ft. 1559.

O. setarius Roem. & Schult. Mt. Mou; 800 ft. 601.

Setaria glauca Beauv. Ermitage Stream. 146.

Cenchrus calyculatus Cav. Nouméa. 64.

Coix Lacryma-Jobi L. Mt. Canala; 1000 ft. 1178.

Miscanthus japonicus Anders. Mt. Mou; 1000 ft. 473.

Ischæmum muticum L. Paompai. 1885.

Andropogon micranthus Kunth. Île Ouéré. 654.

A. refractus R. Br. Mt. Mou; 1000 ft. 525.

A. squarrosus L. R. Dumbéa. 835.

Heteropogon contortus Roem. & Schult. Île Ouéré. 655.

Cynodon Dactylon Pers. Nouméa. 32, 82.

Eleusine indica L. Nouméa. 41.

Centotheca lappacea Beauv. Paompai. 1889.

DICOTYLEDONS.

POLYPETALÆ.

By EDMUND G. BAKER.

RANUNCULACEÆ.

CLEMATIS GLYCINOIDES DC. Mt. Canala; intermediate woods infrequent; 1500 ft. 1254. Low liane. Lord Howe Island, Australia.

DILLENIACEÆ.

TETRACERA EURYANDRA Vahl. Littoral zone, Ouen Toro, near Nouméa. 54. Mt. Mou; cretaceous edge of forest; 600 ft. 561. Near Taom; serpentine plain; 2000 ft. 2285. Corolla white, very sweet scent. Malaya.

HIBBERTIA. The New Caledonian species collected by Mr. Compton fall into 4 sections:—

Sect. I. **Trimorphandra** Brongn. & Gris (genus). Stamina numerosa, exteriora sterilia, altera fertilia, quorum interiora multo majora. Petala 5. Carpella 2 libera circ. 6-ovulata. Flores in spicas 2–4-floras apicem versus ramorum nascentes.

H. PULCHELLA Schlechter. (*Trimorphandra pulchella* Brongn. & Gris.) Plaine des Lacs, abundant on dry hillsides. 364. Shrub 3 ft.

Sect. II. **Polystiche.** Stamina numerosissima, subæqualia vel exteriora subabortiva ovaria circumdantia. Petala 5. Carpella 2–4 multiovulata, ovulis in seriebus paucis dispositis. Flores inter maximos generis in spicas paucifloras vel plurifloras dispositi.

Series 1. Carpella 3–4, ovulis circ. 15. Spicæ sæpius 8–10-floræ.

H. BADOUINI Brongn. & Gris. Nekando Forest; 3–4000 ft. 2125. Small tree 20 ft. Petals bright yellow.

I am doubtful if *H. magnifica* Schlechter from Mt. Mou is specifically distinct.

Series 2. Carpella 2, 20–25 ovulata. Spicæ 2–4-floræ.

H. COMPTONII Bak. fil., sp. nov. *Frutex* bimetralis vel arbor ramulis inferne cicatricibus foliorum delapsorum notatis; *foliis* pro genere majusculis coriaceis sessilibus vel petiolo brevi instructis oblanceolatis, 10–17 cm. longis, 2·5–4 cm. latis, glabris nervis lateralibus tenuibus juxta marginem inter se conjungentibus costa superne impressa subtus conspicua; *floribus* inter maximos generis in spicas unilaterales et 2–4-floras dispositis; *bracteis* majusculis ovatis vel ovato-lanceolatis; *sepalis* sæpius 5 glabrescentibus;

petalis majusculis flavis calyce longioribus 40–45 mm. longis obovatis apice emarginatis; *staminibus* numerosis filamentis filiformibus antheris oblongis; *carpellis* 2 oblique ovoideis stylis subfiliformibus antheras excedentibus ovulis numerosis 20–25 in seriebus paucis dispositis; *fructu* ignoto.

Tonine; mountain-top scrub; 3500 ft. 1934. Flower orange-yellow, slightly scented. Mt. Panié Forest; 2000–3500 ft. 1813. Tree 30 ft., much branched. Calyx segments 5, or in terminal flowers generally 6.

Sect. III. **Trisema** Gilg. Stamina numerosa, ovaria circumdantia. Petala 3–4 vel 1. Carpellum 1, pluriovulatum. Inflorescentiæ rhachis simplex vel furcata.

Series 1. Folia elliptica vel ovato-oblonga, petiolata.

HIBBERTIA CORIACEUM Gilg. River Ngoyé; 2053. Shrub or small tree. Scrubby *Spermolepis* forest; 4000 ft. Presqu'île Bogota; 1323. Shrub 5 ft. Flowers with 3 petals, buttercup yellow. Serpentine scrub; 1000–1500 ft.

The following is closely allied, but there seems to be only 1 petal in the flowers I have dissected. River Comboui. 2008. Shrub 6 ft. Leaves leathery.

H. CORIACEUM Gilg, var. PANCHERI Brongn. & Gris (under *Trisema*). Taom; 2336. Serpentine scrub; 2500 ft. Flowers in irregular cyme. Leaves rigid, lamina 4–6 cm. long, 2–3 cm. broad, petioles 15–20 mm. long. Calyx ±10 mm. long. Petals 8–10 mm. long, yellow.

H. oubatchensis Schlechter belongs to this series.

Series 2. Folia ligulata vel lanceolato-ligulata, sessilia.

H. DEPLANCHEANA Bur. Taom; abundant along river and creekside and lowland scrub; 1500 ft. 2316. Shrub or small tree 30 ft. Petals 3, pale yellow.

Allied to *H. salicifolia* Turcz., *H. ngoyensis* Schlechter, and *H. podocarpifolia* Schlechter in habit. Branchlets densely leafy at the apices, lower down marked with very numerous cicatrices of the fallen leaves. Leaves 7–8 cm. long, 12–15 mm. broad. Flowers in pedunculate one-sided spikes, shorter or sometimes as long as the leaves. Calyx externally sericeous, 9–10 mm. long. Petals 8–10 mm. long. Carpels solitary. This plant is intermediate between the Sections *Trisema* and *Spicatæ*. It has the habit of *H. salicifolia* Turcz. and its allies, but the 3 petals and solitary carpels of the Section *Trisema*.

Sect. IV. **Spicatæ**. Stamina numerosa, æqualia vel subæqualia ovaria circumdantia. Petala sæpissime 5. Carpella 2–3, pluriovulata. Flores mediocres vel parviusculi in spicas secundas vel subsecundas dispositi.

Series 1. Folia sessilia, ligulata vel lanceolato-ligulata.

HIBBERTIA SALICIFOLIA Turcz. Baie Ngo; common shrub on dry hillsides; 200 ft. 264. Shrub 4 ft. Port Bouquet; 2247. Abundant in lowland scrub by riverside; 100 ft. Shrub or small tree reaching 20 ft. Corolla buttercup-yellow. Isle of Pines; serpentine plateau; 300 ft. 2263. Shrub 2 ft. Corolla yellow. Faintly scented. *H. Brongniartii* Gilg is a very close ally.

H. ngoyensis Schlechter, *H. podocarpifolia* Schlechter, and *H. Brongniartii* Gilg also belong to this series.

Series 2. Folia majora, lineari-oblonga vel oblongo-ligulata, inæquilateralia, sessilia.

H. TRACHYPHYLLA Schlechter. (*H. scabra* Brongn. & Gris non R. Br.) River Comboui; serpentine scrub or low hills; 50 ft.; and on alluvial plain. 2007. Shrub 6 ft. Flowers with bright yellow corolla. Kuakué; edge of scrub forest; 100 ft. 951.

Series 3. Folia lineari-oblanceolata, brevissime petiolata. Spicæ laxæ 5–8-floræ.

H. DISSITIFLORA Bak. fil., sp. nov. *Frutex* circ. 6-pedalis ramis teretibus superne bene foliatis inferne cicatricibus foliorum delapsorum notatis cortice cinereo obtectis; *foliis* lineari-oblanceolatis 4–6 cm. longis 10–12 mm. latis apice rotundatis vel leviter emarginatis basi in petiolum 1–3 mm. longum attenuatis superne nitidis subtus opacis et costa prominente; *floribus* parviusculis in spicas laxas subsecundas dispositis, spicis sæpissime 5–8-floris foliis vix æquilongis; *inflorescentiæ* rhachi rufo vel ferrugineo-pubescente; *sepalis* extus pubescentibus oblongo-ellipticis ± 7 mm. longis; *petalis* obovatis vel oblongo-obovatis unguiculatis 6–7 mm. longis; *stylis* ± 3 mm. longis; *carpellis* 2 pauciovulatis.

Baie Ngo; scrub on serpentine; 70 mm. 260. Anthers 1·5 mm. long. A shrub with linear-oblanceolate glabrous leaves and rather small flowers in secund racemes. The bracts are either absent or caducous at an early period.

Series 4. Folia oblongo-oblanceolata vel oblanceolato-spathulata, petiolata. Spicæ 3–5-floræ.

H. ALTIGENA Schlechter. Taom; frequent; 1000–2000 ft. on serpentine scrub. 2300. Shrub 2 ft. Corolla yellow. Petals notched, sweet-scented. River Comboui; among rocks, serpentine; 500 ft. 2220. Scarce. This species is allied to *H. Balansæana* Bur.

Series 5. Folia oblonga vel oblongo-oblanceolata, petiolata. Flores quam in Series 4 numerosiores.

HIBBERTIA INSULANA Bak. fil., sp. nov. *Frutex* circ. 4-pedalis ramulis deorsum cicatricibus foliorum delapsorum notatis sursum foliatis; *foliis* oblongis vel oblongo-oblanceolatatis 5–7·5 cm. longis 1·3–2·0 cm. latis subcoriaceis apice rotundatis vel emarginatis basi cuneatis superne glabris costa impressa subtus costa conspicua, petiolo brevi præditis; *floribus* inter mediocres generis in spicas unilaterales irregulares dispositis rhachi canescenti-tomentosa; *spicis* foliis sæpius paulo longioribus; *bracteis* linearibus vel lineari-lanceolatis floribus brevioribus; *calycis segmentis* 5 extus canescenti-sericeis; *petalis* 5 flavis caducis; *staminibus* numerosis filamentis gracilibus antheris oblongis filamentis multoties brevioribus; *carpellis* 2, circ. 8–10-ovulatis.

Isle of Pines; serpentine scrub; 300 ft. 2270. The noticeable features of this shrub are the oblong or oblanceolate leaves not so close as in *H. Deplancheana* Bur. and narrowed to a short petiole, and the flowers in one-sided irregular spikes. The calyx is canescent tomentose externally.

MAGNOLIACEÆ.

DRIMYS PANCHERI Baill. (*Belliolum Pancheri* Van Tieghem.) Plaine des Lacs. Valley Forest; 1800 ft. 361. Tree 15 ft. Flowers crimson, stamens yellow. Mont Dore. Abundant in scrub of stony hillsides; 2000 ft. 690. Shrub 12 ft. Deep velvety-red corolla. Unpleasant smell.

D. AMPLEXICAULIS Vieill. (*Bubbia auriculata* Van Tieghem.) Ignambi; forest; 3000 ft.; gneiss. 1551. Small tree 10 ft. Whole fructification and peduncles red.

D. HETERONEURA Van Tieghem (sub *Bubbia*). Mont Canala; moist forest; 3000 ft.; schist clay. 1130. Small tree 20 ft. Panicles red, fruits red. This identification is doubtful as Prof. Van Tieghem's description is inadequate.

D. COMPTONII Bak. fil., sp. nov. *Arbor* mediocris 30-pedalis ramulis teretibus hinc inde cicatricibus foliorum delapsorum notatis; *foliis* oblongo-obovatis 8–11 cm. longis 4–5 cm. latis coriaceis, costa crassiuscula, basi in petiolum 10–15 mm. longum attenuatis superne lucidis; *floribus* in summis ramulis spurie umbellatis, radiis glabris cymiferis, cymis pluri- vel multifloris; *calyce* gamosepalo brevissimo; *petalis* oblongis vel lineari-oblongis 4 mm. longis purpureis sec. cl. detectorem; *staminibus* sæpissime 3 antheris flavis; *carpellis* sæpius solitariis ±1 mm. longis stigmate cristiformi lineari obliquo; *fructu* ignoto.

Mont Panié; frequent in forest; 2500–4000 ft.; gneiss. 1815. Inflorescence, primary rays 20–30 mm. long, ultimate pedicels 2–3 mm. long. Closely allied to *D. odorata*, but the leaves are broader, the stamens and carpels fewer, and Mr. Compton states the flowers are scentless.

DRIMYS ODORATA Bak. fil., sp. nov. *Arbor* parva inæqualiter ramosa; *foliis* coriaceis oblanceolatis vel oblongo-obovatis 11–13·5 cm. longis 3·5–5 cm. latis glabris, costa crassiuscula, basi in petiolum 10–12 mm. longum crassum attenuatis nervis lateralibus tenuibus parum prominulis; *floribus* in summis ramulis spurie umbellatis, radiis glabris cymiferis, cymis plurifloris; *bracteis* paucis; *calyce* brevissimo gamosepalo crassiusculo; *petalis* 4 albis 4 mm. longis basin versus maculo purpureo notatis calyce longioribus oblongis vel lineari-oblongis; *staminibus* 5 loculis rimosis; *carpellis* sæpius 2 obovatis ±1 mm. longis compressis stigmate cristiformi lineari obliquo; *fructu* ignoto.

Tonine. Abundant in forest >2500 ft. 1982. Leaves with the broadest point about $\frac{1}{4}$ of the total length from the apex, lateral nerves slender, costa thick, prominent on both sides. Inflorescence with radii branching twice. Primary peduncles 30–40 mm. long, ultimate pedicels generally 5–7 mm. long. The noticeable features of this species are the oblanceolate glabrous leaves with a thick midrib, the flowers with a strong sweet scent, the petals being white with a purple patch towards the base, the generally 5 stamens and 2 carpels.

D. PAUCIFLORA Bak. fil., sp. nov. *Arbuscula* circ. 15-pedalis fide cl. detectorem ramulis tenuibus cortice nigrescente obtectis; *foliis* parviusculis tenuibus oblanceolatis vel oblongo-oblanceolatis vel elliptico-oblanceolatis 4·5–7 × 2-5 cm. glabris basi in petiolum gracilem 7–10 mm. longum attenuatis apice obtusis, costa subtus conspicua, nervis lateralibus tenuissimis inconspicuis; *alabastris* globosis; *floribus* paucis in summis ramulorum sæpissime spurie verticillatis; *pedicellis* gracilibus 2·5–4·0 cm. longis haud furcatis apicem versus applanatis petiolis longioribus; *calyce* brevi gamosepalo; *petalis* 4 rubro-brunneis ovato-oblongis 5–6 mm. longis intus velutinis per anthesin reflexis; *staminibus* numerosis; *carpellis* sæpius 3 ±2 mm. longis stigmate lineari sessili; *fructu* ignoto.

Mont Panié; moist forest; 1500 ft.; gneiss. 1761. Pedicels flattened at top. Anthers yellow. Flowers generally 2. Easily distinguished by the slender leaves much attenuate below, with very slender indistinct lateral nerves, the few flowers on long pedicels, and generally 3 carpels.

ZYGOGYNUM BALANSÆ Van Tieghem. Mont Panié; forest; 1500 ft. Gneiss. 1776. Good sized tree, soft wood, spreading irregular branches. Perianth outer whorl of 4 segments, green outside, yellow inside, inner spiral of about 9 segments, incurved, yellow.

ANONACEÆ.

POLYALTHIA NITIDISSIMA Benth. (*Unona fulgens* Labill.) Mt. Dore; stream valley woods; 100 ft. 666. Tree 25 ft., flowers bright yellow. Queensland.

PAPAVERACEÆ.

ARGEMONE MEXICANA L. Sandy seashore and in cultivated fields near Nouméa, Anse Vata. 77. Widely distributed.

CAPPARIDEÆ.

GYNANDROPSIS PENTAPHYLLA DC. Hienghène; 1861. Weed of cultivation. Perennial plant with unpleasant smell. Petals white, filaments brownish. Leaves soft greyish green. Widely distributed in the Tropics.

CAPPARIS NEOCALEDONICA Vieill. Isle of Pines (Troisième); forest on coral rock, locally frequent. 2275. Sprawling shrub or small tree. Calyx green, corolla white, downy. Filaments long, white.

VIOLACEÆ.

IONIDIUM ILICIFOLIUM Vieill., var. ANGUSTIFOLIUM Deplanche. *Folia* quam in typo perspicue angustiora. Port Déspointes, Nouméa. 238. Small shrub.

I. AUSTROCALEDONICUM Vieill. Mt. Mou; serpentine forest; 1500 ft. 457. Shrub.

I. SERRATUM Bak. fil., sp. nov. (*I. ilicifolium* auct. pro parte.) *Frutex* circ. 3-pedalis ad *I. ilicifolium* Vieill. accedens; *foliis* pallide viridibus oblongo-oblanceolatis 9–11 × 2–3 cm. subcoriaceis margine valde serratis quam iis *I. ilicifolii* longioribus et crassioribus, petiolo 2–3 mm. longo suffultis; *floribus* pedunculatis; *sepalis* ovatis apice rotundatis petalis brevioribus; *petalis* superioribus ± 5 mm. longis ovatis apice obtusis petalo inferiori 8–9 mm. longo ceteris longiori apice emarginato; *antheris* subsessilibus apice in membranam producto; *stylo* erecto validiusculo; *capsulis* elastice 3-valvibus externe glabris 8–9 mm. longis.

Plaine des Lacs; slight slopes. 304. Low shrub 3 ft. The distinguishing features are the coriaceous strongly serrate leaves with the inflorescence shorter than the leaves and the calyx about 3·5 mm. long. It differs from the type of *I. ilicifolium* Vieill. (Vieillard no. 1849) in the more coriaceous longer leaves and larger flowers.

AGATION RUFO-TOMENTOSUM Bak. fil., sp. nov. *Frutex* sarmentosus; *foliis* papyraceis ovatis 7–8 × 4–4·5 cm. abrupte subacuminatis basi subcordatis margine integris petiolo 10–12 mm. longo pubescente suffultis; *floribus* albo-lacteis in racemos laterales dispositis inflorescentiæ rhachi rufo-tomentosa; *sepalis* ±2 mm. longis margine ciliatis; *petalis* 2 dorsalibus brevibus 4 mm. longis lateralibus ±6 mm. longis longioribus labello 9–10 mm. long., petalis lateralibus longioribus superne plurimum lanatis; *ovario* glabro; *fructu* ignoto.

Ignambi; forest; 2500 ft. 1544. Shrub. Flowers cream-coloured, marked and flushed with purple. Calyx ±2 mm. long., lateral. Style ±3 mm. long., slender. The noticeable features of this plant are the ovate glabrous leaves with entire margins and almost subcordate base, the rachis of the inflorescence is rufous-tomentose, the ovary is glabrous. It is closely allied to *A. Vieillardii* Brongn. & Gris, but differs by the rufous-tomentose rachis and subcordate base of the leaves.

AGATION LONGIPEDICELLATUM Bak. fil., sp. nov. *Frutex* sarmentosus humilis ad *A. Vieillardii* Brongn. & Gris valde accedens; *foliis* ellipticis vel oblongo-ellipticis 4·5–6·0 × 2·5–3 cm. apicem versus attenuatis apice ipso obtusis pallide viridibus basi rotundatis vel late cuneatis, petiolo 8–10 mm. longo suffultis; *floribus* in paniculas laterales dispositis paniculis foliis longioribus; *inflorescentiæ* rhachi glabra vel subglabra; *pedicellis* pro genere longiusculis 5–10 mm. longis bracteolatis; *sepalis* 2·5 mm. longis margine ciliatis; *petalis* 2 dorsalibus ±5 mm. longis lateralibus fere aequilongis lateralibus oblongo-lanceolatis ±6·5 mm. longis labello lateralibus distincte longiori ±10 mm. longo; *ovario* glabro stylo obclavato; *fructu* ignoto.

River Comboui; alluvial shrub; 200 ft. 2152. Low liane with light green leaves and greenish-white flowers. The noticeable features of this plant are the elliptical or oblong elliptical glabrous leaves remotely serrate at the margins, the long slender pedicels, the glabrous or almost glabrous rachis, and the glabrous ovary with obclavate style.

The following are closely allied, and are probably forms of this species:—

Taom; serpentine scrub; 1000 ft. 2308. Low shrub with straggling branches. Lip petal white, others streaked with dark purple.

The following is only in fruit:—

Ignambi; abundant in forest; 2000 ft.; gneiss. 1491. Spreading shrub 3–6 ft.

A. COMPTONII Bak. fil., sp. nov. *Frutex* elatus sarmentosus, caulibus lignosis; *foliis* ovato-oblongis 8–10 × 4–5 cm. papyraceis glabris apice acuminatis glabris margine obsolete dentatis nervis lateralibus tenuibus marginem versus arcuatis et inter se conjungentibus, petiolo 12–14 mm. longo suffultis; *floribus* in paniculas terminales et axillares dispositis, paniculis foliis vix longioribus nec ut in *A. Pancheri* Brongn. & Gris duplo

longioribus; *calycis* lobis 5 petalis brevioribus; *petalis* 2 dorsalibus 5–6 mm. longis reflexis rubro-lineatis, lateralibus ±7 mm. longis viridibus prorsus divergentibus, labello pendente superne lanato ±10 mm. longo; *staminibus* 5; *ovario* glabro vel subglabro 2 mm. longo stylo glabro 3 mm. longo apice subclavato.

Mt. Panié; forest; 1200 ft. 1797. Tall liane with thick ropy, woody stem mounting tall trees. Lateral petals directed forwards, greenish lip hanging downwards, woolly on upper side, transverse crimson band in front of wool, beyond that greenish. Calyx 3 mm. long.

Clavis Specierum.

A. Ovarium cinereo-pubescens vel cinereo-tomentosum. *A. Pancheri* Brongn.

B. Ovarium glabrum vel subglabrum.

- *a.* Inflorescentiæ rhachis rufo-tomentosa. Folia ovata basi fere subcordata, margine integro. *A. rufotomentosum* Bak. fil.
- *b.* Inflorescentiæ rhachis pilis vestita. Folia ovato-oblonga margine subintegro vel obsolete serrata. *A. Comptonii* Bak. fil.
- *c.* Inflorescentiæ rhachis glabra vel subglabra.
    - Pedicelli breviusculi. Petioli 3–5 mm. longi. *A. Vieillardii* Brongn.
    - Pedicelli longiusculi. Petioli 8–10 mm. longi. *A. longipedicellatum* Bak. fil.

PITTOSPOREÆ.

Pittosporum xanthanthum Schlechter. Comboui Mts.; scrubby coniferous forest; 3500 ft. 2179. Serpentine shrub or small tree. Leaves in pseudo-whorls, downy beneath when young, glabrous later. Calyx red-brown. Petals yellow with stripes of red-brown on outside of each midrib, reflexed. Faintly scented.

Var. nov. parvifolium Bak. fil. *Frutex* circ. 6-pedalis; foliis 3–4·5 cm. longis 8–15 mm. latis quam in typo minoribus oblanceolatis basi in petiolum brevem sensim angustatis; *floribus* luteis calyce 4 mm. longo; *petalis* recurvatis linearis-oblanceolatis ±12 mm. longis; *ovario* deorsum hirto.

Tonine; mountain-top scrub; 3500 ft. 1936. Shrub 6 ft. Flowers daffodil-yellow. Petals recurved. Calyx brown. Fruit oval, black. Seeds numerous.

P. paniculatum Brongn. & Gris. Ignambi; forest; 2000 ft. Gneiss. 1695. Small woody plant 6 ft. Flowers creamy yellow. Corolla reflexed. Peduncles and pedicels reddish, glandular. Scentless.

PITTOSPORUM PANICULATUM Brongn. & Gris, var. nov. COMPTONII Bak. fil. *Frutex* erectus circ. 4-pedalis; *foliis* lineari-oblanceolatis 10–12 cm. longis 17–20 mm. latis quam iis typi multo minoribus; *floribus* subumbellatis; calyce 8 mm. longo; *petalis* albis ±20 mm. longis oblanceolatis calyce subtriplo longioribus; *ovario* pilis patentibus vestito.

Mt. Panié; forest; 1500 ft. Gneiss. 1778. Small, erect, woody. Simple stem. Leaves in successive zones. Petals pure white, claws erect, limbs spreading. Sweet-scented. Petioles 15–20 mm.

P. PANICULATUM Brongn. & Gris, var. nov. ODORATISSIMUM Bak. fil. *Frutex* erectus lignosus circ. 6-pedalis; *foliis* oblanceolatis 17–21 cm. longis, 35–42 mm. latis, petiolo 20–25 mm. longo suffultis; *floribus* racemosis majusculis odoratissimis; *petalis* ±32 mm. longis flavescenti-albis calyce sub 4-plo longioribus.

Presqu'île Bogota; shrub forest with *Spermolepis*; 1500 ft. Serpentine. 1337. Leaves in groups, separated by internodes of several inches. Flowers yellowish white. Petals rolled back. Filaments white. Very sweet-scented. Calyx 10 mm. long.

P. FRAGRANS Schlechter. R. Tchiem; rocks in river course; 100 ft. 2000. Scarce. Tree 25 ft., copiously branched, giving dense shade. Calyx green. Corolla white. Petals rolled back. Sweet strong scent. Perhaps identical with *P. suberosum* Pancher.

P. PENDULIFLORUM Bak. fil., sp. nov. *Frutex* ramulis teretibus; *foliis* alternis membranaceis 7–13 cm. longis 25–40 mm. latis oblanceolatis hinc inde interdum margine dentatis interdum integris apice ipso obtusis, basi in petiolum 5–8 mm. longum attenuatis, superne costa impressa subtus prominente, nervis lateralibus tenuibus marginem versus furcatis et inter se conjungentibus; *floribus* albis axillaribus dependentibus solitariis vel binis, pedicellis gracilibus; *calycis segmentis* brevibus; *petalis* 4 coalitis albis apice reflexis ±7 mm. longis; *staminibus* 4 petalis brevioribus; *ovario* glabro, stylo columnari.

Mt. Mou; serpentine forest; 1500 ft. 460. Shrub, white hanging flowers. Corolla white, with col erent petals. Noticeable on account of the membranous alternate oblanceolate leaves and pendulous white solitary or subsolitary flowers.

P. ECHINATUM Brongn. & Gris. Ignambi; frequent in forest; 2000–3000 ft. 1499. Shrub or small tree 20 ft. Leaves thin, undulate at margins. Flowers in dense clusters. Calyx russet. Corolla white, its segments reflexed. Sweet scent.

PORTULACEÆ.

PORTULACA OLERACEA L. Mt. Mou; rock crevice, old plantation area; 1000 ft. 520. Widely distributed.

HYPERICINEÆ.

Hypericum gramineum Forst. fil. Mt. Canala; frequent in dry Niaouli association; 0–2000 ft. 1263. Herb 3–12 in. Annual. Leaves and stem often going red, usually pale green. Flowers yellow. Australia.

GUTTIFERÆ.

Garcinia corymbosa Sebert & Pancher (sub *Discostigma*). Paompai; creekside; 200 ft. 1882. Small tree 20 ft. Flowers rather fleshy. Green calyx disc. Petals pinkish white. White latex. The plant named *G. collina* Vieillard, collected by *Schlechter*, 15003, should be referred here. *Garcinia pedicellata* Seem. (*Clusia pedicellata* Forst.) is either identical or a close ally.

G. collina Vieill. River Comboui; *Callitris* forest; 200 ft. 2162. Tree 25 ft. Flowers small, fleshy, sweet-scented. Calyx greenish. Corolla white. Tonine Forest; 1000 ft. 1927. Small tree 20 ft. Leaves scanty on flowering branches. Corolla yellowish white. Native name "Itahimbaombi." Port Bouquet; small creek in lowland serpentine scrub; 100 ft. 2249. Small tree. Calyx creamy yellow. Corolla white, rather fleshy. Strong sweet scent.

G. Comptonii Bak. fil., sp. nov. *Arbuscula* circ. 15-pedalis ramulis validis subteretibus rigidis; *foliis* crassiusculis ovatis 3·5–5·0 × 2·5–3·5 cm. rigidis apice obtusis vel emarginatis basi acutis petiolo 3–5 mm. longo rubescente brevi suffultis costa crassiuscula nervis lateralibus tenuibus approximatis erecto patentibus; *floribus* ♂ parvis 1–2–4 ad pulvinos axillares insertis pedicellis brevissimis 1–2 mm. longis basi bracteatis; *sepalis* concavis subæqualibus decussatis; *petalis* crassiusculis; *staminibus* numerosis; *floribus* ♀ ignotis.

Poume; 2365. Allied to *G. sessilis* Seem. and *G. collina* Vieill. Differs by the rigid dark dull ovate leaves, obtuse at the apex, and creamy-yellow flowers from the old wood. It may be distinguished from its nearest allies as follows:—

a. Folia longiuscule acuminata, petiolo circ. 12 mm. longo suffulta.
G. sessilis Seem.

b. Folia apice obtusa vel subobtusa.
Folia 5–10 cm. longa, petiolo 5–10 mm. longo suffulta.
G. collina Vieill.
Folia crassiora, 3·5–5·0 cm. longa, petiolo 3·5 mm. longo suffulta.
G. Comptonii Bak. fil.

Calophyllum caledonicum Vieill. Plaine des Lacs; streamside in scrub region. 391. Tree 25 ft.

MONTROUZIERA CAULIFLORA Planch. & Triana. River Comboui; scrubby and *Spermolepis* woods, especially on serpentine alluvium; 0–500 ft. 2200. Small formal pyramidal tree 15 ft. Yellow latex. Petals thick, yellowish, with scarlet and rose flushes. Mont Taom; serpentine scrub; 500–2500 ft., abundant. 2341. Shrub 4 ft., spreading habit. Latex yellow, sticky. Corolla fleshy, rose and yellow. Stamens greenish. Scentless.

M. VERTICILLATA Planch. & Triana. Mont Koghi; open serpentine scrub > 2000 ft. 730. Shrub 3 ft. Flowers proterandrous. Corolla spherical, pink, fleshy.

TERNSTRŒMIACEÆ.

MICROSEMMA SALICIFOLIA Labill. Hieghene roadside. 2006. Small tree 20 ft. Leaves medium green. Fls. male only, perianth green, anthers yellow.

M. COMPTONII Bak. fil., sp. nov. (Pl. **16.** figs. 1–7.) As this species differs markedly from the species on which the genus was founded, I have ventured to propose the following sections:—

Sect. **Eumicrosemma.** Sepala 5–6 imbricata. Squamæ petaloideæ breves, 5–6, bifidæ. Ovarium mutiloculare. Stylus brevis, stigmate 5–6-fido. Capsula globosa, 10–12 locularis. Frutex erectus, ramosus. Folia oblonga.
M. salicifolia Labill. *M. oblongum* Schlechter.

Sect. **Sapotophyllum.** Sepala 4–5–6 imbricata. Squamæ petaloideæ nullæ. Squamarum minutarum annulus, setaceus, inter ovarium et andrœcium interpositus. Ovarium ±8 loculare. Capsula ignota. Arbuscula circ. 25-pedalis. Folia ovata vel elliptica.

M. (§ Sapotophyllum) COMPTONII Bak. fil., sp. nov. *Arbor* circ. 25-pedalis ramis novellis cinereo-hirtis; *foliis* ovatis vel ellipticis 6–10 × 4·5–6 cm. margine integris subtus cinereis nervis lateralibus tenuissimis numerosis, costa subtus conspicua, apice rotundatis vel leviter emarginatis basi rotundatis vel late cuneatis petiolis 13–24 mm. longis crassiusculis præditis; *floribus* ex axillis foliorum fasciculatis fasciculis sæpissime 2–3-floris, pedunculis 5–8 mm. longis 1-floris petiolis brevioribus; *perianthio* crasso 6–7 mm. longo coriaceo persistente laciniis 5 rarius 4 vel 6 extus cinereis; *squamis* setaceis minutis filamentis numerosis a fundo calycis ortis; *ovario* hirsuto circ. 8-loculari, ovulis solitariis, stylo erecto, stigmate terminali; *fructu* ignoto.

Ignambi; forest; 3500 ft., uncommon. Gneiss. 1579. Small tree 25 ft. Perianth green, thick. Dalla Torre and Harms in their 'Genera Siphonogamarum' place *Microsemma* in Flacourtiaceæ ; Schlechter places it next *Wikstrœmia* in Thymelæaceæ.

MALVACEÆ.

Malvastrum tricuspidatum A. Gray. Nouméa. 222. Common roadside weed with yellow flowers. Decumbent, 6–12 inches. Widely spread.

Hibiscus tiliaceus L. Île Porc Épic; littoral zone, rare. 917. Tree 25 ft. Flowers large, sulphur-yellow with deep crimson blotch at base of petals. Widely distributed.

Thespesia populnea Soland. Ouen Toro near Nouméa. 61. Tree 20 ft. Littoral zone. Widely distributed.

STERCULIACEÆ.

Sterculia (§ Acropogon) Comptonii Bak. fil., sp. nov. *Arbor* erecta ; *foliis* maximis ad apices approximatis petiolatis, lamina subcordata usque ad 35 cm. longa ultra medium 5-lobata papyracea glabra reticulato-nervosa lobis apicem versus lobulatis petiolo ±31 cm. longo glabro ; *inflorescentia* caulina paniculata 8–9 cm. longa multiflora pyramidali ramis ramulisque brunneo tomentosis pedicellis brevibus teretibus brunneo-tomentosis ; *corolla* in floribus masculis 8–9 mm. longa campanulata extus brunneo-tomentosa 5–6-lobata lobis oblongis ; *androgynophoro* ±1·5 mm. longo in floribus masculis antheris subæquilongo, antheris uniseriatis, thecis parallelis, columnæ apice dense fulvo-barbata ; *floribus fœmineis* ignotis.

Paompai ; forest ; 100 ft. 1865. Tree with crowns of thin leaves. Perianth with 5–6 segments, dull yellowish, two crimson streaks on inside of each petal. Scentless. A tree with large papyraceous 5-lobed leaves and pyramidal panicle of rather small dull yellow flowers allied to *Sterculia* (*Acropogon*) *fatsioides* Schlechter, but differing in the larger thinner leaves.

S. bullata Pancher & Sebert. Nouméa, Port Ngéa ; littoral zone. 47. Tree of 40 ft. Agrees with Pancher no. 108. A tree of 40 ft., with glaucous suborbicular leaves and male flowers with a uniseriate ring of anthers.

Melochia odorata Linn. fil. Mont Canala ; 1500 ft. 1264. Small tree 25 ft. Ignambi ; creek at forest edge ; 1500 ft. Gneiss. 1605. Small tree. Pedicels and calyces reddish. Corolla creamy, flecked with white. Slight scent. Widely distributed.

Commersonia echinata Forst. Mt. Mou ; cretaceous forest ; 800 ft. 512. Mont Panié ; edge of Niaouli forest ; 1000 ft. Gneiss. 1825. Small tree 20 ft. Flowers creamy white, scentless. Widely distributed.

TILIACEÆ.

TRIUMFETTA RHOMBOIDEA Jacq. Ermitage. 784. Weed of cultivation. Cretaceous. Perennial 4 ft. Widely distributed.

ELÆOCARPUS RIVULARIS Vieill. Isle of Pines; serpentine plateau, creekside in scrub area. 2267. Shrub or small tree. Leaves thin, reddish when old. Flowers pendent, white; petal margins fringed. Slight scent.

E. MYRTILLUS Schlechter. Nekando; serpentine scrub among boulders. 2029. Small shrub 2 ft., spreading over ground. Flowers pendent. Calyx and corolla white. Petals fringed. Scented. I am doubtful if this species is distinct from *E. vaccinioides* Brongn. & Gris.

E. VIEILLARDII Brongn. & Gris. Ignambi; forest; 2000 ft. Gneiss. 1480. Large tree 40 ft., spreading crown. Flowers pendent. Sepals white. Petals white, fringed, sometimes flecked with red. Faint scent.

E. NODOSUS Bak. fil., sp. nov. *Frutex* circ. 4-pedalis ramulis teretibus cortice nigrescente obtectis inferne cicatricibus foliorum delapsorum notatis; *foliis* tenuiter coriaceis ovatis vel obovatis 6–10 cm. longis 33–53 mm. latis apice sæpius rotundatis basi cuneatis, costa subtus conspicua, nervis lateralibus utrinque 8–9 marginem versus furcatis, petiolis 12–20 mm. longis suffultis; *floribus* pendulis parviusculis in racemos dispositis racemis erectis vel suberectis foliis brevioribus; *sepalis* lanceolatis 5–6 mm. longis glabrescentibus vel parce pubescentibus, petalis subæquilongis; *petalis* cuneatis albis apice inæqualiter incisis, *staminibus* circ. 30 apiculatis; *ovario* biloculari, stylo gracili; *fructu* ellipsoideo cinereo glabro ± 15 mm. longo, 8–10 mm. lato.

Poume; 2379. Serpentine scrub; 800–1300 ft., abundant. Petal margins serrate. Sweet-scented. Noticeable on account of the obovate or ovate somewhat coriaceous leaves, and racemes of rather small pendent white flowers in half-erect racemes.

E. OVIGERUS Brongn. & Gris. Taom; creekside forest; 400 ft. Serpentine. 2315. Tree 30 ft., bark rough grey. Flowers pendulous. Calyx white, fleshy. Corolla creamy-white, petal margins serrate. Slightly scented.

E. GEMINIFLORUS Brongn. & Gris. Mt. Canala; forest; 2000 ft. 1111. Tree 30 ft. Leaves dark green, brown nerves projecting on under side, the upper surface corrugated. Flowers large. Calyx pale yellowish. Corolla white, petals fimbriated. Anthers numerous, with points. The calyx is 5–5·5 cm. long, the petals 5 cm. long. Noticeable on account of the very large flowers and corrugated surface of the leaves.

E. ALATERNOIDES Brongn. & Gris, var. nov. GRANDIFOLIUS Bak. fil. *Frutex* 6-pedalis sec. cl. detectorem; *foliis* subcoriaceis 6–7 cm. longis

15–23 mm. latis quam iis typi majoribus oblanceolatis apice rotundatis vel emarginatis longius petiolatis (petiolis 10–17 mm. longis); *floribus* parviusculis pendulis in racemos laxos dispositis; *sepalis* ±5 mm. longis lineari-lanceolatis; *petalis* 5–6 mm. longis lacteis; *ovario* biloculari.

Cap Bocage. Occasional in serpentine scrub; 500 ft. 1370. Flowers pendulous on erect reddish peduncles. Corolla cream-coloured. Differs from the type by the longer oblanceolate leaves with longer petioles. The lax raceme of pendulous cream-coloured flowers is sweet-scented. The sepals are linear-lanceolate, 5 mm. long.

ELÆOCARPUS TONINENSIS Bak. fil., sp. nov. *Arbuscula* 25-pedalis ad *E. rivularem* Vieill. accedens, ramis cortice cinereo obtectis; *foliis* chartaceis margine undulatis ovatis vel ovalibus 5–6·5 cm. longis 2–3 cm. latis basi attenuatis apice acuminatis apice ipso obtusis, subtus costa conspicua, nervis lateralibus tenuibus, petiolis 8–12 mm. longis suffultis; *floribus* parviusculis albis in racemos paucifloros dispositis; *sepalis* ovatis 3–5 mm. longis puberulis petalis brevioribus; *petalis* oblongis 4–5 mm. longis apice dentatis; *staminibus* circiter 25, filamentis antheris brevioribus; *ovarii* loculis 2 pauci-ovulatis; *fructu* ignoto.

Tonine Forest; 2000 ft. 1961. Small tree 25 ft. Leaves simple, thin, stiff, undulate margin, medium green, shining. Flowers white, petals curved inwards. Slight scent. Allied to *E. rivularis* Vieillard. Differs in the fewer flowered racemes and the ovate not lanceolate sepals. It is a small tree with few flowered racemes, and chartaceous leaves with markedly undulate margins.

E. DOLICHOPODUS Bak. fil., sp. nov. *Frutex* 3-pedalis, ramis teretibus cicatricibus foliorum delapsorum notatis; *foliis* oblanceolatis vel oblongo-oblanceolatis 4–4·5 cm. × 1–1·5 cm. basi in petiolum brevem 1–2 mm. longum attenuatis apice obtusis costa subtus conspicua, nervis lateralibus tenuibus; *floribus* paucis lateralibus pedicellis longiusculis gracillimis teretibus; *sepalis* lanceolatis ±8 mm. longis margine albo-hirsutis; *petalis* albis ±10 mm. longis apice dentatis calyce paullo longioribus; *staminibus* circiter 10, filamentis hirtis, antheris brevioribus; *ovario* pubescente triloculari; *capsulis* trilocularibus apice acuminatis pendentibus in toto ±2·5 cm. longis 1·3–1·5 cm. latis.

Cap Bocage; frequent in serpentine scrub; 900 ft. 1392. Shrub 3 ft. Leaves light green. Flowers below leaves, white, pendulous. Fruit pendent, capsular, trilocular. A shrub with pendent flowers below leaves, and an acuminate trilocular capsule.

E. COMPTONII Bak. fil., sp. nov. *Arbor* ad *E. ovigerum* Brongn. & Gris accedens, ramis ramulisque teretibus vel subteretibus cortice cinerascente obtectis cicatricibus foliorum delapsorum notatis ; *foliis* coriaceis obovatis vel oblongo-obovatis 8·5–11·5 cm. × 5·5–6·5 cm. costa subtus conspicua, nervis lateralibus 8–9 marginem versus furcatis et inter se conjungentibus apice obtusis basi cuneatis, petiolis 20–25 mm. longis prædítis ; *floribus* pendulis speciosis in racemos paucifloros dispositis ; *sepalis* crassiusculis 22–26 mm. longis lineari-lanceolatis ; *petalis* oblongo-cuneatis 23–27 mm. longis glabris apice inæqualiter et breviter lobulatis ; *staminibus* erectis antheris linearibus 6 mm. longis apiculatis ; *ovario* cano-tomentoso biloculari, stylo gracili ; *fructu* ignoto.

Couliné (Neketé) ; 1279. Large tree. Calyx fleshy, white. Corolla thin, carmine. Petal tips fringed. Flowers pendulous. Pedicels 16–20 mm. long. Noticeable on account of the large showy flowers in few-flowered racemes.

MALPIGHIACEÆ.

ACRIDOCARPUS AUSTROCALEDONICUS Baill. Baie Ngo ; streamside ; 70 m. 259. Tree 20 ft. Poume ; abundant in scrub 500–1300 ft. 2381. Shrub 3 ft. Spreading leaves, medium green, grey downy below. Yellow corolla, brown calyx. Scentless. R. Dumbéa ; flood plain. 418. Fruit a three-winged samara.

RYSSOPTERIS TIMORENSIS Blume. Ouen Toro ; in *Acacia spirorbis* woods. 779. Slender woody climber forming large masses of trees. Fruit three-winged. Malaya, Australia.

Var. NEO-CALEDONICA Bak. fil., var. nov. *Folia* elliptica vel suborbicularia, subtus tomento brevi cinereo induta, floribus flavis.

Port Déspointes Wood, Nouméa. 134. Leaves 3–5·5 cm. long, 2·5–3 cm. broad. Wood climber. Flowers buttercup-yellow.

R. TAOMENSIS Bak. fil., sp. nov. *Frutex* scandens ad *R. timorensem* Bl. valde accedens ; *foliis* oppositis ovatis vel ovato-oblongis acutis vel rarius obtusis 40–55 mm. × 21–25 mm. supra pallide viridibus subtus plus minus griseo-viridibus, petiolis 8–11 mm. longis suffultis ; *inflorescentia* terminali vel axillari, pedunculis pedicellisque cano-tomentosis ; *calycis lobis* apice obtusis extus cano-tomentosis glandulosis ; *petalis* flavis breviter unguiculatis 1 cm. longis ; *staminibus* 10 filamentis filiformibus glabris basi in urceolum connatis ; *ovario* trilobo triloculari stylis 3 gracilibus stigmatibus capitellatis ; *samaris* apice in alam expansis 20–23 mm. longis junioribus pilis plus minus obtectis latere tuberculatis.

Mont Taom ; serpentine ; 2000 ft. 2286. Liane, ultimate branches drooping. Leaves thin, soft, light green above, greyish below. Flowers sweet-scented. Corolla bright yellow. Calyx ±3 mm. long. The leaves are smaller than in *R. timorensis* Blume and rounded at the base and much more deeply crowded. The corolla is bright yellow.

GONOSTYLACEÆ.

Solmsia chrysophylla Baill. Mont Dore; serpentine scrub; 1000 ft., occasional. 842. Shrub 6 ft. Mont Mou; dry serpentine scrub; 2000 ft. 429. Flowers green, scented. Presqu'île Bogota; serpentine scrub; 1500 ft. 1322. Small shrub 3 ft. Leaves medium green, shining above, grey green below.

LINACEÆ.

Hugonia penicillanthemum Baill. River Comboui; *Callitris* forest; 100 ft.; serpentine. 2151. Small shrub 2 ft. Leaves thin, dark green. Calyx green. Corolla bright yellow. Sweet-scented.

H. racemosa Schlechter. Mont Mou; streamside in damp gulley; 800 ft.; cretaceous. 549. Sprawling shrub. Flowers widely open, petals yellow.

Erythroxylon novocaledonicum O. E. Schulz. River Ngoyé; *Casuarina* forest by river; 500 ft. 1015. Shrub or small tree 12 ft. Flowers sparse, solitary, dull red.

ZYGOPHYLLACEÆ.

Tribulus moluccanus Decne. Anse Vata. Creeping on sand. 83. Pinnate leaves, yellow petals. Fruit spiny. Moluccas, Timor.

OXALIDACEÆ.

Oxalis corniculata L. Anse Vata; sand pit. 73. Widely distributed.

O. fruticosa Vieill. in Herb. Taom; upland serpentine scrub; 3000 ft. 2328. Small weak subshrub 1 ft. Leaves dark green, tinged purple. Flowers yellow, delicate.

RUTACEÆ.

Zieridium gracile Baill. River Ngoyé (Mts. to N.W. of); serpentine scrub; 2000 ft., fairly frequent. 1000. Low shrub 2 ft. Flowers white. Leaves dark green above, light and dotted beneath.

Boronella Francii Schlechter. Plaine des Lacs; occasional in serpentine flood plain; 800 ft. 343. Small undershrub 1–1½ ft. Flowers white. This specimen agrees with Franc 247 in Herb. Kew.

B. parvifolia Bak. fil., sp. nov. *Frutex* 1–3-pedalis ad *B. Francii* Schlechter valde accedens, ramis glabris cortice cinereo obtectis; *foliis* parviusculis oppositis summitatem versus ramulorum confertis simplicibus subsessilibus coriaceis obovatis 10–13 mm. longis apice emarginato superne nitidis glanduloso-punctatis, petiolis 1–1·5 mm. longis suffultis; *floribus* albis ad summitatem ramulorum cymosis vel ad axillas foliorum supremorum subumbellatis; *sepalis* 4 lanceolatis petalis brevioribus; *petalis* 4 ovato-oblongis 3–4 mm. longis filamentis crassiusculis glanduloso-verrucosis; *antheris* intus sub apice filamentis insertis; *carpellis* 4.

Taom; frequent in serpentine scrub; 500–2000 ft. 2296. Shrub 1–3 ft. Leaves aromatic. Corolla white tinged with pink. Scentless. The leaves of this plant are cuneate-obovate and shorter than in *B. Pancheri* Baill., *B. verticillata* Baill., or *B. Francii* Schlechter.

MYRTOPSIS MACROCARPA Schlechter. River Dumbéa; 200 ft. 827. Shrub 8 ft. Leaves dark green, rich red-brown beneath. Cap Bocage; serpentine scrub. 1371. Shrub usually ±3 ft. Leaves finely pubescent when young on upper surface, glabrous later. Cap Bocage; scrubby woods on serpentine. 1372. Shrub 5 ft.

ERIOSTEMON PALLIDUS Schlechter. Kuakué; flood plain of river, frequent. 910. Shrub 5 ft. Flowers among leaves, almost sessile, white. Mont Dore; shrub; 1000 ft. 686. Shrub 6 ft. Flowers white, green outside. Ngoyé in *Spermolepis* woods just above rice; 200 ft. 960. Small tree 12 ft.; dark green leaves. Flowers white.

E. CORYMBOSUS Labill. Plaine des Lacs; open dry slope. 396. Shrub. A form with leaves smaller than those figured by Labillardière.

MELICOPE PLATYSTEMON Bak. fil., sp. nov. *Arbuscula*; *foliis* alternis petiolatis trifoliolatis foliolis intermediis majoribus oblongis vel ellipticis 15–26 cm. × 6–8·5 cm. lateralibus 11–15 cm. × 4–6 cm. inæquilateralibus superne glabris subtus costa pubescente nervis lateralibus marginem versus furcatis et inter se conjungentibus petiolis 7–10 cm. longis suffultis; *floribus* viridi-albis aggregatis in axillis foliorum delapsorum dispositis glomerulis subsessilibus; *calycis lobis* 4 ovatis brevibus; *petalis* 4 punctatis 8–9 mm. longis oblongis vel oblongo-lanceolatis; *staminibus* 8, 6–7 mm. longis filamentis applanatis; *disco* ovarium circumdante; *ovario* 4-lobo loculis 4 biovulatis, stylo erecto, stigmate terminali crasso.

Ignambi; forest; 2500 ft. Gneiss; uncommon. 1717. Inflorescence almost sessile, clusters on main stem in axils of fallen leaves. Calyx brown. Petals greenish white, the tips spreading. Slightly scented. Calyx 1·5–2 mm. long. A curious species with alternate, digitately trifoliolate leaves and subsessile clusters of flowers, with 8 stamens with flattened filaments. The ovary is 4-lobed and the loculi biovulate. It is a very anomalous species of *Melicope* and may be worthy of generic rank.

M. MONTANA Bak. fil., sp. nov. *Frutex* circ. 6-pedalis ramulis cortice nigrescente obtectis inferne cicatricibus foliorum delapsorum notatis; *foliis* digitatim trifoliolatis foliolis terminalibus oblongo-oblanceolatis vel anguste

obovatis 20–33 mm. × 11–14 mm. basi cuneatis apice acutis vel obtusis subtus costa prominente pubescente lateralibus inæquilateralibus paullo minoribus, petiolis mediocribus 5–13 mm. longis instructis ; *floribus* in cymas axillares paucifloras in axillis foliorum supremorum dispositis ; *calyce* 4–4·5 mm. longo brunneo extus pubescente ; *petalis* 4 albis oblongis vel oblongo-oblanceolatis ±5 mm. longis extus pubescentibus ; *staminibus* 8 filamentis hirtis ; *ovario* extus albo hirsuto ; *fructu* ignoto.

Tonine ; mountain-top scrub ; 3500 ft. 1937. Shrub 6 ft. Leaves thickened, soft. Calyx brown. Corolla white, scentless. A shrub with trifoliolate leaves and white, scentless, tetramerous flowers in the axils of the leaves. There are 8 stamens with hairy filaments.

COMPTONELLA Bak. fil., gen. nov.

Flores hermaphroditi, parvi. *Calycis lobi* 4 petalis breviores. *Petala* 4, valvata, subrecta. *Discus* brevis, sinuatus. *Stamina* 4 basi disci inserta, antheris oblongis. *Ovarium* 4-lobum, pubescens, 4-loculare, loculis petalis oppositis. *Stylus* erectus, centralis, sursum attenuatus, stigmate capitato globoso vix lobato. *Cocci* 1–3, ovoidei vel obovoidei, indehiscentes, nigrescentes, sessiles, sæpissime 1-spermi. *Semina* ovata, nigrescentia, testa opaca. *Arbuscula* 25-pedalis, ramis erectis rigidis. *Folia* opposita, 1-foliolata iis *Bauerellæ australianæ* Borzi subsimilia, foliolis integerrimis petiolatis, nervis lateralibus tenuibus marginem versus furcatis et inter se conjungentibus, costa subtus prominente. *Cymæ* axillares, floriferæ petiolis subæquilongæ, fructiferæ petiolis longiores, foliis breviores. *Flores* inter minores ordinis, albi. (Pl. **15**. figs. 1–6.)

This genus is allied to *Evodia*, but is distinguished at once by the marked difference in the fruit, which does not separate into two valves. It differs from *Melicope*, *Pelea*, and *Baurella* in the stamens being isomerous with the sepals, and also in the fruit. Several of the simple-leaved species of *Evodia* have now been transferred to other genera. *Evodia* (§ Peleopsis) *crotonifolia* Baill. is *Myrtopsis Novæ-caledoniæ* Engler.

C. ALBIFLORA, sp. nov. *Arbuscula* 25-pedalis sec. cl. detectorem ramis erectis rigidis ; *foliis* unifoliolatis ellipticis vel ovalibus 40–60 mm. × 20–33 mm. apice subobtusis basi late cuneatis nervis lateralibus tenuibus utrinque 6–8 marginem versus arcuatis, costa subtus prominente, sub lente punctatis, petiolo mediocri 15–18 mm. longo suffultis ; *floribus* albis minutis in cymas laterales dispositis ; *cymis* floriferis petiolis subæquilongis ; *calyce* 1–1·5 mm. longo lobis 4 petalis brevioribus ; *petalis* 4 albis ±1·5 mm. longis margine incurvis ; *staminibus* 4 basi disci insertis ; *ovario* 4-loculari ; *coccis* nigrescentibus 1-spermis ±4·5 mm. longis indehiscentibus extus sub lente rugulosis ovoideis seminibus exalbuminosis.

Ignambi ; forest ; 3500 ft., gneiss. 1542. Flowers scentless. Calyx 1–1·5 mm. long.

The following clavis indicates its position with its nearest allies :—

- A. Stamina 8–10.
    - *a*. Cocci dehiscentes. *Melicope* and *Pelea*.
    - *β*. Sarcocarpus crassus, carnosus. *Sarcomelicope*.
- B. Stamina 4–5.
    - *α*. Cocci dehiscentes.
        - * Folia sæpissime trifoliolata et opposita. *Evodia.*
        - ** Folia alterna, simplicia. *Geijera.*
    - *β*. Cocci indehiscentes. Folia opposita, unifoliolata. *Comptonella.*

EVODIA CANALENSIS Bak. fil., sp. nov. *Arbuscula* 20-pedalis, ramulis cortice cinereo obtectis glabris vel fere glabris ; *foliis* trifoliolatis foliolis terminalibus oblongo-oblanceolatis 6–9·5 cm. longis 16–23 mm. latis apice acuminatis apice ipso obtusis foliolis lateralibus parum inæquilateralibus nervis lateralibus tenuibus marginem versus arcuatis, petiolo communi 15–20 mm. longo suffultis ; *floribus* minutis albis suaveolentibus in cymas pedunculatas dispositis ; *cymis* petiolis brevioribus ; *calyce* ±1 mm. longo lobis 4 triangularibus minutis ; *petalis* 4 triangularibus ±1·5 mm. longis apice acutis antheris exsertis flavis ; *stylo* erecto stigmate terminali capitato ; *coccis* parviusculis ±3 mm. longis.

Mont Canala ; intermediate forest ; 1500 ft. 1196. Also abundant by streamside in Niaouli region ; 1000 ft. Leaflets 6–7·5 cm. long, 16–23 mm. broad, common. This species belongs to the Sect. Trifoliolatæ Engler and is allied to *E. Lamarckiana* Benth., but the leaflets and carpels are smaller. The flowers are small, white, sweet-scented, 4-merous, in short pedunculate axillary cymes.

E. LACTEA Bak. fil., sp. nov. *Frutex* 6-pedalis, ramulis cortice nigrescente obtectis deorsum cicatricibus foliorum delapsorum notatis ; *foliis* digitatim trifoliolatis subcoriaceis foliolis oblongo-oblanceolatis vel oblanceolatis 30–42 mm. × 10–15 mm., costa superne impressa, subtus conspicua, nervis lateralibus tenuibus inconspicuis, petiolo communi 8–10 mm. longo suffultis ; *floribus* 4-meris in cymas parvulas et densas laterales et breviter pedunculatas dispositis ; *cymis* 10–15 mm. longis ; *calyce* brevi ; *petalis* lacteis ±1·5 mm. longis breviusculis ; *staminibus* 4 ; *carpellis* 4.

Nekando ; *Callitris* forest ; 4000 ft. ; serpentine ; shrub 6 ft. 2122. Calyx green, other parts of flower creamy white. Leaves digitately trifoliolate. Calyx green, ±1 mm. long. This plant belongs to the Sect. Trifoliolatæ Engler and is noticeable on account of the oblanceolate or oblong-oblanceolate leaflets, and the small flowers in short rather small and dense lateral cymes.

Vieillard 2156 is closely allied.

E. LAMARCKIANA Benth. (*Lepta triphylla* Lour.) Mt. Canala ; frequent by streamside, Niaouli region ; 1000 ft. 1247. Small tree 25 ft. Leaves

trifoliolate, dark green, dull surface, almost same colour both sides. Flowers small, white, in axillary panicles. Fruit small. China, India, Ceylon, etc.

Zanthoxylon Blackburnia Benth. Poume; frequent; 1000 ft.; scrub. 2386. Small tree or shrub. Leaves pinnate, the pinnæ very asymmetrical, yellowish pale green. Fruit spherical, each with one black seed. Australia.

Z. neocaledonicum Bak. fil., sp. nov. *Arbor*; *foliis* paripinnatis oppositis circ. 6-jugis ±32 cm. longis foliolis tenuiter coriaceis elliptico- vel oblongo-lanceolatis 13–13·5 cm. longis 40–45 mm. latis inæquilateralibus apice acuminatis basi cuneatis nervis lateralibus tenuibus, costa subtus conspicua, petiolulis brevibus, petiolo communi longo præditis; *floribus* albis carnosulis cymosis; *cymis* axillaribus ±14 cm. longis folio 2-plo brevioribus; *floribus masculis* sepalis ovatis brevibus petalis multo brevioribus ±2 mm. longis; *petalis* oblongis 8–9 mm. longis carnosulis staminibus longioribus; *staminibus* 4 antheris majusculis; *ovario* rudimentario stigmate coronato.

Mt. Mou; forest; 3000 ft. 575. Tree. Flowers white, fleshy.

A tree with paripinnate leaves and about 6 pairs of opposite leaflets. The flowers are white and fleshy and borne in axillary cymes much shorter than the leaves. The filaments are thick and also fleshy. The pedicels are covered with lepidote scales. 1071 from River Ngoyé, which is only in fruit, is allied.

Z. albiflorum Bak. fil., sp. nov. *Arbuscula*; *foliis* pinnatis circ. 7-jugis ±40 cm. longis foliolis ovatis vel ellipticis glabris petiolulatis superne subnitidis basi inæquali apice acutis nervis lateralibus tenuibus utrinque 5–6 marginem versus inter se conjungentibus proximalibus ±8 cm. longis 4–4·5 cm. latis distalibus 8–9 cm. longis 2·5–3 cm. latis; *floribus* tetrameris in corymbum pedunculatum 9–10 cm. longum dispositis, corymbis cum foliis hornotinis; *floribus masculis* calycis tubo brevi glabro dentibus brevibus acutis calyce in toto ±2 mm. longo; *petalis* oblongis concavis albis glabris ±6 mm. longis apicem versus glandula munitis; *staminibus* 4 antheris 3 mm. longis majusculis; *ovario* rudimentario; *floribus femineis* ignotis.

Mt. Mou; 2000 ft. 493. Small tree 12 ft. White flowers in terminal and axillary corymbs. Leaves pinnate in crown at top of simple stem. A small tree with pinnate leaves and about 7 pairs of elliptical or oblong glabrous leaflets. The flowers are paniculate, the inflorescence being about ¼ the length of the leaves.

Dutaillyea Comptonii Bak. fil., sp. nov. *Arbor* 25-pedalis, foliis oppositis amplis pinnatim trifoliolatis oblongo-obovatis 30–33 cm. longis

13–15 cm. latis margine revolutis, costa subtus valde prominente, utrinque nervis lateralibus 15–18 basi attenuatis, apice acutis, petiolo communi longo valido subtus convexo supra canaliculato instructis, petiolulis apice sensim in foliolorum costam abeuntibus, petiolo communi ±30 cm. longo suffultis; *floribus* in paniculas axillares dipositis pedicellis rugosulis paniculis 14–15 cm. longis et latis; *calycis dentibus* acutis; *petalis* 10–12 mm. longis calyce 2–3-plo longioribus; *ovario* conoideo 4-loculari; *fructu* ignoto.

Mont Panié; 1818. 3000 ft. Gneiss. Tree 25 ft. Leaves opposite. Panicles axillary. Flowers scentless. Petals creamy, tips streaked with rose. Calyx ±4 mm. long. Differs from *Dutaillyea trifoliolata* Baill. by the leaves being pinnately trifoliolate and 30–33 cm. long instead of digitately trifoliolate and 10–15 cm. long.

DUTAILLYEA TRIFOLIOLATA Baill. ex descript. Ignambi; forest; 2000 ft. Gneiss. 1475. Small tree. Leaves opposite. Axillary panicles. Petals rather thick and stiff, tinged with rose-pink. Scentless. Wood smells of sulphur. Requires comparison with type.

ACRONYCHIA LÆVIS Forst. Mt. Mou; cretaceous forest scrub. 517. Shrub. Mt. Dore; stream valley; 100 ft. Serpentine. 661. Tree 25 ft. Flowers dull white. Australia.

A. LÆVIS Forst., var. PAUCIFLORA Vieill. Poume. Lowland serpentine scrub 50 ft. near water. 2369. Low shrub 2 ft. Flowers scented. Petals white, green-tipped. Filaments white. This is the same as Vieillard 285 *bis*.

PHELLINE BILLARDIERI Panch. Paompai; forest; 1000 ft. 1894. Small tree 15 ft. Leaves dark green above. Terminal panicle of grey-green tricarpellary fruit. Fruits contain much latex, absent from stem and leaves.

P. COMOSA Labill. Plaine des Lacs; Kaori; forest. 394. Tree.

P. COMOSA Labill., var. CANALENSIS Bak. fil., var. nov. *Arbor* 30-pedalis vel ultra; *foliis* maximis ±55 cm. × 14 cm. quam iis typi multo majoribus; *paniculis* ±28 cm. foliis brevioribus; *fructibus* pallide viridibus exsiccate nigrescentibus.

Mont Canala; moist forest; 1500 ft. Schists. 1197. Crown of dark green shining leaves. A whorl of leaves alternates with a whorl of smaller green bracts and subtends a series of axillary panicles. Inflorescences have reddish axes and pale green fruits. Specimens from Labillardière are in the Museum Collection.

P. LUCIDA Vieill. Comboui Mts.; serpentine forest; 3000 ft. 2184. Small tree 20 ft. Corolla white, the petals tipped with pink. Scentless.

Phelline erubescens Baill. Tonine; forest; 1500 ft. 1949. Small tree. Leaves medium green, shiny. Flowers white, sweet-scented. Petals recurved. Probably also 916 from Île Porc Épic. Tree 25 ft. The description of the genus *Phelline* in Bentham and Hooker's 'Genera Plantarum,' now that more species are known, requires certain additions. The flowers are 4–5-merous and the ovary sometimes 5-locular. The genus includes not only shrubs, but also trees 20 ft. high. Ten species have been described.

Murraya flava Bak. fil., sp. nov. *Arbor* 25-pedalis, ramis teretibus vel subteretibus; *foliis* pinnatis 1–4-jugis foliolis membranaceis 6–7 cm. longis 30–38 mm. latis parum inæquilateralibus ovatis vel ellipticis opacis, costa subtus conspicua, basi cuneatis subsessilibus nervis lateralibus tenuibus; *floribus* flavis suaveolentibus sæpius in racemos laterales dispositis fide cl. detectorem; *calyce* brevi ±1 mm. longo dentibus brevissimis; *petalis* 7–8 mm. longis carnosulis lineari-oblongis; *disco* prominente ovarium circumdante cupuliformi margine crenato; *stylo* elongato stigmate capitato; *fructu* ignoto.

Mont Mou; forest margin, cretaceous; 600–1000 ft. 456. Tree 25 ft. Flowers yellow, strong suffocating smell. Noticeable on account of the yellow flowers with a strong suffocating smell and prominent disc.

Micromelum coriaceum Seem. Île Ouéré. 652. Shrub 8 ft. Common in *Acacia spirorbis* association. Isle of Pines; forest on coral soil; 50 ft. 2282. Small tree 20 ft. Flowers white, sweet-scented. Fiji.

M. pubescens Blume. Mt. Mou; cretaceous forest; 1000 ft. 518. Shrub or small tree. Widely distributed in Tropical Asia and Pacific Islands.

SIMARUBACEÆ.

Soulamea Pancheri Brongn. & Gris. Kuakué. Fairly often in lowland scrub. Flood plain of river. 907. Shrub 4 ft. Stem little branched, with velvety clothing on young plants. Abundant leaves towards apex, thick but soft and pliable. Fruits two-winged on axillary racemes. Kuakué scrub; 800 ft. 940. Shrub. River Comboui; *Callitris* forest by river 200 ft.; serpentine. 2154. Small tree. Leaves dark green above, veins prominent not stiff. Perianth green, reflexed, anthers brown. Scentless.

S. Muelleri Brongn. & Gris. Taom; abundant in serpentine scrub; 500–2000 ft. 2313. Small shrub, stem erect, simple and slightly branched. Flowers greenish yellow. Slight scent. Fruit 2-winged.

Suriana maritima L. Anse Vata; sea sand; 76. Isle of Pines; very abundant on coral sand; 2261. Shrub 8 ft. Leaves fleshy. Corolla delicate white, caducous. Widely distributed.

OCHNACEÆ.

Strasburgeria calliantha Baill. Nekando; conifer forest; 3500 ft.; serpentine. 2021. Small tree 25 ft. Branches brittle. Perianth spiral, about 8 segments sepaloid, about 5 petaloid, transparent, veined, and mottled with dark crimson. Scentless. Rimlike disc surrounding ovary.

MELIACEÆ.

Dysoxylum Comptonii Bak. fil., sp. nov. *Arbor* circ. 40-pedalis; *foliis* pinnatis 20–25 cm. longis 4–5-jugis foliolis 9–10·5 cm. × 3·5–4 cm. oblongis vel subobovato-oblongis supra glabris opacis subtus pallidioribus petiolulatis basi inæquali apice acutis nervis lateralibus tenuibus 8–10; *floribus* albis carnosulis spicatis tetrameris; *spicis* e ramis vetustioribus vel e trunco oriundis; *calycis lobis* 4 rotundatis tubo brevissimo calyce in toto 1·5 mm. longo; *petalis* 5–6 mm. longis extus puberulis vel fere glabris; *tubo stamineo* glabro petalis inferne connato antheris 1·25 mm. longis; *disco* cupuliformi.

Mont Canala; by stream in Niaouli region; 1000 ft. 1244. Leaves pinnate, alternate, medium green. Flowers in spikes sometimes clustered on old wood and main stem, white, fleshy. A tree with pinnate glabrous leaves, and spikes of white tetramerous flowers from the old wood and main stem. Allied to *D. Vieillardii* C. DC.

D. gamosepalum Bak. fil., sp. nov. *Arbuscula* circ. 25-pedalis; *foliis* abrupte pinnatis circ. 10-jugis ±36 cm. longis foliolis ovatis vel ellipticis vel subobovato-ellipticis 6–8 cm. × 3·5–4·5 cm. utrinque glabris petiolulatis basi leviter inæquali nervis lateralibus tenuibus 6–8 arcuatis; *floribus* 4–5 meris aggregatis e trunco oriundis; *calyce* recurvato ±1 mm. longo gamosepalo; *petalis* 4 vel 5 inferne coalitis; *tubo stamineo* glabro antheris 8–10 summo tubo stamineo inclusis; *disco* campanulato; *stylo* erecto stricto stigmate capitato; *fructu* rotundato sec. cl. detectorem seminibus 3–4, in quoque loculo solitariis.

Ignambi; fairly frequent in moist forest; 2000–3500 ft. Gneiss. 1711. Flowers on main trunk in small dense clusters. Perianth fleshy. Calyx pink, recurved. Corolla tubular, white, tip of stigma crimson. Fruit round, with 4 ridges and 3–4 brown seeds, one in each loculus, fruit-wall brown, corky. Calyx ±1 mm. long. Petals 11 mm. long. A tree 25 ft. with short gamosepalous calyx and flowers arising from the trunk.

D. nitidum A. DC. in DC. Monog. Phanerog. i. 522. Presqu'île Bogota. Occasional in serpentine scrub. 1000 ft. 1327. Shrub 6 ft. Flowers white. Petals yellowish on outside, caducous. R. Ngoyé. In *Spermolepis* forest near stream. 500 ft. Small tree. Leaves pinnate, medium green. Inflorescence axillary. Flowers white.

DYSOXYLUM CANALENSE A. DC. in DC. Monog. Phanerog. i. 505. River Comboui. Scrubby *Spermolepis* woods; 500 ft.; serpentine. 2206. Small tree 20 ft. Panicles drooping. Flowers white. Calyx segments reflexed. Scentless.

OLACINEÆ.

XIMENIA ELLIPTICA Forst. fil. Littoral zone, Ouen Toro near Nouméa. 51. R. Tchiem; littoral scrub river course near sea. 1999. Straggling shrub, long spreading main shoots. Leaves thin, soft, medium green. Flowers greenish yellow, with copious white hairs on inner surface of corolla. Pacific Islands.

ILICINEÆ.

SPHENOSTEMON COMPTONII Bak. fil., sp. nov. (Pl. **16**. figs. 1–7.) *Arbor* circ. 30-pedalis, ramis glabris; *foliis* oblongis vel oblongo-oblanceolatis 8–10 cm. longis 35–40 mm. latis subcoriaceis superne nitidis costa crassiuscula nervis lateralibus 8–9 marginem versus arcuatis et inter se anastomosantibus, petiolo 15–20 mm. longo prædlitis; *floribus* inter mediocres albis in racemos 7–9 cm. longos laxos 7–15-floros dispositis; *sepalis* 4 ellipticis vel oblongo-ellipticis 6–7 mm. longis dorso pubescentibus; *petalis* 4 imbricatis ovatis 7–8 mm. longis sepalis subæquilongis; *staminibus* 6 trigonis sessilibus ±5 mm. longis antheris linearibus longitudinaliter dehiscentibus; *ovario* 2-loculari hirto, loculis 1-ovulatis ovulis pendulis, stigmate capitato coronato.

Ignambi; forest; 3500 ft., scarce. 1693. Tree 30 ft. Leaves stiff, dark green above, light beneath. Flower white, rather fleshy. Petal and anther fused. Pedicels 6–8 mm. long. Differs from *S. Balansæ* in having hermaphrodite flowers and 6 stamens.

CELASTRINEÆ.

GYMNOSPORIA PANCHERIANA Loes. Canala; lowland serpentine scrub; 100 ft. 1310. Shrub 4 ft.

MENEPETALUM SALICIFOLIUM Loes. Ignambi; fairly frequent in forest; 2000 ft. 1476. Shrub 8 ft. Flowers yellowish green.

SALACIOPSIS Bak. fil., gen. nov.

Flores unisexuales, actinomorphi, pro ordine majusculi. *Flores masculi. Sepala* 5 inter se libera, rotundata, 2 exteriora paullo minora. *Petala* 5 ovata vel oblongo-ovata, calyce 2–3-plo longiora. Stamina 5 extra discum carnosum inserta, petalis paullo breviora et iis alterna. *Ovarii* rudimentum cum disco lobulato confluens. *Flores feminei. Sepala* valde imbricata. *Petala* 5–7, præfloratione valde imbricata. *Stamina* 0. *Staminodia* 0. *Ovarium* triloculare, disco crasso valde prominente semiimmerso, ovulis in loculis plerumque 2 juxta basin affixis erectis. *Stylus* brevis, validus. *Stigma* trilobum.

Arbuscula circ. 20-pedalis, ramis teretibus. *Folia* majuscula, simplicia, alterna vel pseudoverticillata, petiolo brevissimo instructa. *Flores* fasciculati e nodis ramorum orti. *Pedicelli* graciles floribus 2–3-plo longiores circ. medium bracteolis minutis instructi. *Fructus* immaturus 3-locularis, verisimiliter capsularis, calyce petalisque stipatus. (Pl. **17**. figs. 1–6.)

Allied to the genus *Menepetalum*, but differs in having large flowers with a calyx in which the sepals are free to the base, the two exterior smaller, and in the female flower 5–7 petals. The leaves are also different; they are in successive zones, either alternate or pseudo-verticillate, not as in *Menepetalum* opposite. The flowers are fasciculate, the pedicels being one-flowered. The disc is thicker and lobulate.

SALACIOPSIS NEOCALEDONICA, sp. nov. *Arbuscula* ramis teretibus; *foliis* alternis vel pseudoverticillatis oblongis vel ellipticis 8–14 cm. × 3·5–7·5 cm. glabris apice acutis vel subobtusis superne nitidis, subtus costa prominente, nervis lateralibus tenuibus utrinque 9–11, petiolis brevissimis 1–3 mm. longis crassiusculis instructis; *floribus* ♂ axillaribus fasciculatis e nodis ortis; *calyce* membranaceo sepalis rotundatis 1·5–2·5 mm. longis; *petalis* ovatis 6–7 mm. longis calyce 2–3-plo longioribus; *pedicellis* gracilibus 6–10 mm. longis floribus longioribus bibracteolatis; *bracteolis* minutis; *staminibus* 5 extra discum carnosum insertis; *ovario* triloculari, stylo brevissimo, stigmate trilobo.

Ignambi; small tree, male. Five stamens with dark yellow anthers. Central disc resembles a 5-locular ovary, but contains no ovules. 1600. Female, 1692.

Ignambi; occasional in forest; 2000 ft. Gneiss. 1479. Small tree 20 ft. Leaves in successive zones. Sepals cream-coloured. Petals white. Ovary light yellow, scentless.

The noticeable features of this species are the pseudoverticillate, ashen-grey, glabrous, nearly sessile leaves, and the flowers in fascicles from lateral nodes. The ovary is trilocular.

PERIPTERYGIA MARGINATA Loes. River Comboui; alluvial riverside scrub; 0–300 ft., abundant. Serpentine. 2165. Small shrub fastigiate habit. Corolla white. Fruit 3-winged capsule. Seeds winged. River Dumbéa; flood plain; 410. Shrub 6 ft. Baie Ngo; dry hillsides, common shrub; 254. Kuakué; abundant in sandy and stony flood plain of river; 902. Shrub 5 ft. Hard, stiff, almost erect leaves. Flowers small, white, in axillary dichasia, honeyed, sweet-scented. Fruits 3-winged, splitting into three valves at the apex, the valves remaining attached.

SALACIA PANCHERI Baill. River Comboui; forest by creek, serpentine alluvium. 2230. Small tree 20 ft. Branches dorsiventral. Leaves dark green above. Flowers dull yellow, petals recurved.

SALACIA (§ Dicarpellum) NEOCALEDONICA Loes. Ignambi; forest; 2500 ft. Gneiss. 1578. Shrub or small tree of irregular growth. Flowers green. Fruits oval. Ignambi; creekside woods; 1500 ft. Frequent. Gneiss. 1667. Shrub or small tree. Leaves often distichous. Flowers greenish yellow.

RHAMNACEÆ.

VENTILAGO MADERASPATANA Gaertn. River Ngoyé; *Spermolepis* forest; 400 ft., serpentine. 2097. Tall liane. Leaves shiny. Peduncles green. Perianth green. Stamens yellow. Broad central disc. Sweet strong scent. India, Java.

V. NEOCALEDONICA Schlechter. Taom, *Casuarina* association; 200 ft., serpentine. 2347. Small tree 15 ft.

COLUBRINA ASIATICA Brongn. Île Ouéré; abundant in littoral zone; 645. Shrub 6 ft. Green flowers with large honey disc. Thin light green, shining leaves. Widely distributed in Tropical Asia, also in S.W. Africa.

ALPHITONIA ZIZYPHOIDES A. Gray. Mt. Dore; common in stream valley; 100 ft., serpentine; 664. Leaves dark green above, almost white beneath. Peduncles and calyces brown. Flowers small, greenish yellow. River Dumbéa; 200 ft., serpentine; 830. Shrub 10 ft. Branches and leaves horizontal. Leaves red-brown below when young. Pacific Islands.

A. XEROCARPA Baill. Presqu'île Bogota; scrub, shrubby woods; 1000 ft., serpentine; 1330. Shrub or small tree up to 20 ft. in creeks. Midrib reddish. Flowers white, sweet-scented. Nekando; forest, especially near margin; 3000 ft., serpentine; 2024. Small tree 25 ft. Corolla white, sweet-scented.

SAPINDACEÆ.

LOXODISCUS CORIACEUS Hook. fil. Taom; serpentine scrub; 2500 ft., frequent. 2333. Shrub 6 ft. Leaves soft. Sepals glandular, very proterandrous. Fruit red-brown, covered with dark stalked glands. Isle of Pines.

ARYTERA CHARTACEA Radlk. Ouen Toro; *Acacia spirorbis* wood. 777. Tree 20 ft.

GUIOA COLLINA Schlechter. Paompai; creekside and wood margin; 1866. Tonine; forest margin and creekside; 1000 ft. 1954. Small tree 20 ft. Flowers white, sweet-scented. 1076 from Mt. Nekando may also belong here, but the flowers are only in bud.

G. MICROSEPALA Radlk. Mont Canala; forest; 2500 ft., schists. 1135. Tree 25 ft. Also Mont Panié; forest; 1500 ft. 1771; and Ignambi; forest; 2000 ft. 1849.

GUIOA GLAUCA Radlk. Île Porc Épic; edge of forest. 914. Tree 30 ft. Leaves light green, hard, paripinnate. Fruit three-winged with a waxy bloom.

G. PECTINATA Radlk. Mont Mou; damp gulley near edge; 800 ft. Niaouli region. 548. Shrub 10 ft. White flowers, scented.

STORTHOCALYX PANCHERI Radlk. Plaine des Lacs; *Dacrydium* association on moderate serpentine slopes; uncommon. 315. Shrub 3–4 ft. Flowers white, scentless.

HARPULLIA AUSTROCALEDONICA Baill. Ignambi; forest intermediate; 2500 ft. 1631. Small tree; pinnate leaves, medium green, dull, paripinnate. Flowers on lateral panicles, peduncle bronze green, calyx yellowish, petals greenish white; scentless. Large saucer-like disc outside staminal whorl. Perhaps also 915 from Île Porc Épic belongs here.

DODONÆA VISCOSA Jacq. Canala; lowland serpentine scrub on hill; 1308. Shrub 4 ft. Presqu'île Bogota; dry serpentine scrub; 1353. Widely distributed.

CUPANIOPSIS PETIOLULATA Radlk. Mont Canala; streamside, Niaouli region. 1194. Small tree.

C. AZANTHA Radlk. Ignambi; forest; 2000 ft. 1486. Gneiss. Corolla white, shorter than the sepals. Stamens 10. Requires comparison with type.

C. GLOMERIFLORA Radlk. Port Déspointes Woods, Nouméa; *Acacia spirorbis* woods, uncommon. 139. Shrub 4 ft. Flowers white, sweet-scented.

ANACARDIACEÆ.

EUROSCHINUS VERRUCOSUS Engler. The following is a form of this species with fewer pairs of leaflets. Isle of Pines; coral forest. 2283. Tree 20 ft. Leaves pinnate, light green. Flowers small, green. Anthers yellow. Sweet-scented.

E. RUBROMARGINATUS Bak. fil., sp. nov. *Arbuscula* 15-pedalis, ramulis cinerascentibus lenticellis plus minus obtectis; *foliis* ±5-jugis 20–30 cm. longis foliolis oppositis vel suboppositis 9–11·5 cm. × 2·5–3·0 cm. oblongis acuminatis breviter petiolulatis (petiolulis ±3·5 mm. longis) infimis brevioribus basi parum obliquis; *paniculis* ±30 cm. longis foliis subæquilongis puberulis ramulis infimis longioribus; *floribus* breviter pedicellatis; *calyce* cupuliformi 1·5 mm. longo dentibus brevibus; *petalis* 5 ellipticis ±2·5 mm. longis flavo-viridibus calyce 2–3-plo longioribus; *staminibus* extra discum insertis; *disco* breviter cupuliformi; *stylo* erecto, stigmate trilobo; *fructu* ignoto.

River Comboui; *Callitris* forest by river; 200 ft. 2155. Serpentine.

Small tree 5 ft. Leaves edged with red. Panicle terminal. Flowers widely open, yellowish green.

A tree with about 5 pairs of oblong acuminate leaflets, shortly petiolulate, and a panicle of small yellowish-green flowers about as long as the leaves. Allied to *E. elegans* Engler, but there are more pairs of leaflets and the inflorescence is not so lax, and it is puberulous.

EUROSCHINUS SYLVICOLA Bak. fil., sp. nov. *Arbuscula* ad *E. verrucosum* Engl. accedens, ramulis cinerascentibus lenticellis plus minus dense obtectis; *foliis* imparipinnatis circ. 5-jugis 5–6 dm. longis foliolis oblongo-ovatis vel oblongo-ellipticis 9–13 cm. × 4–5 cm. apice acuminatis basi late cuneatis costa subtus prominula nervis lateralibus tenuibus utrinque 12–15 marginem versus arcuatis supra glabris petiolulo longiusculo instructis; *paniculis* multifloris 3–4 dm. longis quam folia paullo brevioribus sparse pubescentibus; *floribus* pallide flavis breviter pedicellatis glomeratis; *calycis lobis* semiorbicularibus calycis in toto 1–1·5 mm. longo; *petalis* ± 2 mm. longis oblongis; *staminibus* extra discum insertis filamentis brevibus antheris flavis 1·25 mm. longis; *ovario* rudimentario; *drupis* ignotis.

Mont Humboldt; forest; 500 ft.; serpentine. 2087. Leaves imparipinnate, rachis grey mottled with brown, pinnæ medium green, thin. Terminal panicle. Flowers pale yellow, scentless; anthers yellow.

Noticeable on account of the glabrous, oblong-ovate or oblong-elliptical acuminate leaflets, and panicle 3–4 dm. long.

MONTAGUEIA Bak. fil., gen. nov.

Calyx brevis, glaber, tubo turbinato, limbo truncato vel subtruncato. *Petala* 4–5, valvata, oblonga, demum reflexa. *Stamina* 4–5 petala numero æquantia et iis alternantia, antheræ dithecæ rimis longitudinaliter dehiscentes. *Discus* vix lobatus ovarium circumdans. *Ovarium* superum 1-loculare, ovulum a funiculo infra apicem suspensum. *Stylus* erectus, gracilis, stigmate capitato. *Arbuscula* 20-pedalis. *Folia* imparipinnata ± 4-juga cum impari, foliolis herbaceis ovato-lanceolatis petiolulatis margine crenato-serratis vel undulatis, costa subtus prominente, nervis lateralibus tenuibus. *Paniculæ* terminales circ. dimidium foliorum æquantes, ramis approximatis patentibus. *Flores* pallide flavi, parviusculi, in ramulos ultimos glomerulati, glomerulis 6–12-floris. *Bracteolæ* minutæ. *Fructus* ignotus. (Plate **15.** figs. 7–9.)

Allied to *Euroschinus*, from which it differs in its haplostemonous flowers and truncate calyx. The style is erect and shorter than the stamens. The stamens are alternate with the petals, the anthers being relatively rather large and longer than the filaments. The petals are valvate and not imbricate as in *Euroschinus*.

MONTAGUEIA HAPLOSTEMON, sp. nov. *Arbuscula* 20-pedalis; *foliis* imparipinnatis ± 4-jugis cum impari ± 30 cm. longis foliolis inæquilateraliter

ovato-lanceolatis 9–11 cm. longis 40–45 mm. latis apice acuminatis apice ipso obtusis basi late cuneatis margine remote crenato-serratis vel subundulatis, costa subtus prominula, nervis lateralibus tenuibus petiolulis 4–5 mm. longis ; *floribus* pallide flavis paniculatis ; *paniculis* terminalibus quam folia brevioribus pedicellis gracilibus ; *calycis limbo* subtruncato tubo turbinato calyce in toto 0·5–0·75 mm. longo ; *petalis* 4–5 oblongis demum reflexis ±2·5 mm. longis ; *staminibus* 4–5 petala numero æquantibus ; *ovario* ovoideo, ovulo infra apicem loculi suspenso.

Paompai ; forest margin ; 1500 ft. Shales. 1897. Leaves light green. Inflorescence terminal. Flowers pale yellow, sweet-scented. Petals reflexed, anthers brown.

A small tree with imparipinnate leaves and about 4 pairs of ovate-lanceolate leaflets, and a terminal panicle of flowers. The ultimate clusters or glomerules are arranged in a subumbellate manner, and contain 6–12 flowers.

RHUS SIMARUBÆFOLIA A. Gray, var. nov. NEOCALEDONICA Bak. fil. *Frutex* ramulis pilosis teretibus vel subteretibus ; *foliis* imparipinnatis 10–13 cm. longis foliolis 3–4-jugis cum impari lateralibus leviter inæquilateralibus oblongis 3–4 cm. longis margine integris vel rarissime hinc inde serratis superne glabris apice acutis basi cuneatis terminalibus 5–5·5 cm. longis 15–22 mm. latis, petiolo communi semiterete instructis ; *floribus* albis parviusculis paniculatis ; *calycis segmentis* brevibus extus glabris calyce in toto ±1 mm. longo ; *petalis* calyce longioribus imbricatis albis oblongis obtusis ±2 mm. longis ; *ovario* glabro sessili stylis brevibus ; *drupis* globosis lævibus ±4 mm. diam.

Port Déspointes Woods, Nouméa. 136. Shrub. Flowers white.

The type comes from Fiji. This variety differs from type in its oblong petals, etc.

SEMECARPUS NGOYENSIS Bak. fil., sp. nov. *Arbuscula* 20-pedalis sec. cl. detectorem ; *foliis* coriaceis glabris 12–17·5 cm. × 6–7·5 cm. supra opacis ellipticis vel oblongo-ellipticis apice obtusis vel emarginatis basi acutis nervis lateralibus utrinque 13-15 subtus conspicuis, petiolo 4–5 cm. longo supra canaliculato suffultis ; *floribus* in paniculis 5–13 cm. longis digestis ramis 2–3 cm. longis atro-tomentosis erecto-patentibus ; *calyce* cupuliformi laciniis imbricatis ; *petalis* crassiusculis ±6 mm. longis quam iis *S. Balansæ* Engler longioribus ; *ovario* in floribus hermaphroditis globoso atro-fusco, stylis divergentibus.

River Ngoyé ; shrubby *Casuarina* association by riverside ; 400 ft. Serpentine. 2112 and 2103. Petals pinkish white. Ovary very dark brown, velvety. Dark viscous exudation from cut stems. Leaves with dull upper surface.

Differs from *S. Balansæ* Engler, with which it has been compared in the Paris Herbarium, by the dull upper surface of the leaves and longer petals,

SEMECARPUS ATRA Vieill. Paompai; creekside woods; 50 ft. 1905. Stout tree 30 ft. Sturdy trunk, wide-spreading branches. Leaves dark green above, glaucous below, basal half of petiole corky-like stem, veins yellowish conspicuous. Corolla white central yellow, honey disc. Sweet scent. White latex.

Isle of Pines; roadside; 50 ft. 2280. Tree 30 ft., dense foliage dark green above, glaucous below. Corolla dingy yellowish white. Ovary black. Sweet scent.

LEGUMINOSÆ.

LOTUS AUSTRALIS Andr., var. nov. ANFRACTUOSUS Bak. fil. *Caulis* anfractuosus foliolis oblongo-obovatis glauco-viridibus; *calycis dentibus* acutis; *floribus* rubro-purpureis; *carina* subalbida; *leguminibus* rectis calyce 5–6-plo longioribus.

Isle of Pines, Ouro. Coral and shell-sand, littoral zone edge nearest sea. 2252. Perennial prostrate. Leaves pale glaucous green, fleshy. Corolla red-purple, carina whitish. Scentless.

Agrees with a specimen collected by Macgillivray at the Isle of Pines.

ARTHROCLIANTHUS GRANDIFOLIUS Bak. fil., sp. nov. *Arbor* circ. 20-pedalis ramulis fere glabris; *foliis* trifoliolatis foliolis terminalibus majusculis 10–12 cm. × 4·5–5 cm., papyraceis glabris ellipticis vel elliptico-obovatis basi attenuatis foliolis lateralibus minoribus 9–10 cm. × 3–4 cm., parum inæquilateralibus; *inflorescentiæ axi* folio breviori 3–4 cm. longo; *floribus* albis graciliter pedicellatis pedicellis puberulis floribus sæpius 6–10 in inflorescentia; *calyce* gamophyllo anguste campanulato 7–8 mm. longo, extus minute puberulo lobis triangularibus tubo brevioribus; *corollæ partibus* subæquilongis; *vexillo* 30–33 mm. longo, sec. cl. detectorem erecto; *alis* basi longe unguiculatis carinæ adhærentibus; *carina* ±35 mm. longa, alis paululum longiori; *ovario* stipitato pubescente lineari; *legumine* ignoto.

Mt. Canala; by creek forest region; 1000 ft. 1204. Small tree 20 ft. Leaves medium green, shining above. Flowers creamy white, scentless. Alæ stuck firmly to the carina. Vexillum erect, its margin unrolled. Stamens 10, the dorsal free.

A. COMPTONII Bak. fil., sp. nov. *Arbuscula* circ. 20-pedalis ad *Desmodium Andersonii* Seem. valde accedens, ramulis teretibus cortice griseo cinereo obtectis; *foliis* trifoliolatis foliolis oblongo-ellipticis utrinque glabris basi cuneatis nervis lateralibus tenuibus; *floribus* albis in racemos axillares dispositis pedicellis gracilibus 17–18 mm. longis; *calyce* campanulato ±7 mm. longo, pilis sparse tecto lobis brevioribus; *corollæ partibus* inæquilongis; *vexillo* ±2 cm. longo, carina distincte breviori; *carina* 26–30 mm. longa, subfalcata; *fructu* 10–16 cm. longo, lomentaceo distincte stipitato 3–8-segmenta gerente, segmentis ellipticis facie reticulatis, 14–18 mm. longis, stipite ±3 cm. longo.

Tonine; creekside forest; 1000 ft. 1928. Small tree 20 ft. Native name "Ehu" Poyes tribe. Calyx and corolla white. Sweet-scented.

This plant is very closely allied to *Desmodium Andersonii* Seem., of which only fruiting specimens are known, but differs in the narrow terminal leaflets and more numerous segments of the fruit.

Rhachis of inflorescence 2–3 cm. long. Wings 2 cm. long. The last revision of this genus is by Dr. Hochreutiner in Ann. Jard. Bot. Genev. (1909) 30–46. Dr. Schindler subsequently described the genus *Nephrodesmus*, transferring *Arthroclianthus sericeus* and *A. macrobotrys* to that genus, also *Desmodium* (?) *Francii* Harms, and describing one new species, *N. albus*.

CROTALARIA STRIATA DC. Mt. Mou; cretaceous. 462. Widely distributed.

INDIGOFERA SUFFRUTICOSA Miller (*I. Anil* Linn.). Port Déspointes; woods; shrub 6 ft. 223. Widely distributed in tropical regions.

TEPHROSIA PURPUREA Pers. Paompai; creekside rocks; 2000 ft. 1912. Small undershrub, branches erect. Corolla purple, standard erect.

Île Ouéré; littoral sand. 648. Low prostrate shrub. Widely distributed.

PHASEOLUS ADENANTHUS G. F. W. Mey. (*P. truxillensis* H. B. K.). Paompai; creekside weed; 2000 ft. 1876. Twiner. Corolla purple, keel yellowish, coiled in 2–3 turns of spiral. Widely distributed.

P. NEOCALEDONICUS Bak. fil., sp. nov. *Rhizoma* crassum; *caule* volubili ferrugineo-hirto; *stipulis* sagittatis infra insertionem productis; *foliis* pinnatim trifoliolatis, foliolis lateralibus 5–7 cm. longis 2·5–3 cm. latis, inæquilateralibus apice subacuminatis foliolis terminalibus 6–8 cm. longis, æquilateralibus lobatis, lobo medio majore apice acuminatis basi late cuneatis; *floribus* flavis ad apicem pedunculorum paucis pedunculis ferrugineo-hirtis; *calyce* brevi 3–3·5 mm. longo, dentibus brevibus; *vexillo* ±11 mm. longo, calyce 2–3-plo longiori; *carina* apice incurva; *leguminibus* linearibus elongatis polyspermis juvenilibus ±7 cm. longis.

Paompai; Niaouli association; 0–2000 ft. Perennial, stout rootstock eaten by natives named "Maniania." Corolla yellow, widely open, apex of keel twisted over to one side.

Allied to some forms of *Phaseolus Mungo* L.

PUERARIA THUNBERGIANA Benth. Mont Mou; cretaceous edge of stream forest. Niaouli region; 800 ft. 605. Woody climber. Purple flowers, blotch of yellow in middle of base of standard. Widely distributed.

DESMODIUM UMBELLATUM DC. Cap N'dona littoral; uncommon; 867. Ignambi; 1846. Occasional in Niaoul iassociation; 300 ft.; gneiss. Small undershrub 1 ft. Corolla white. Paompai; 1877. Creekside; 200 ft. Shrub 12 ft. Corolla ivory-white. Widely distributed.

GLYCINE TABACINA Benth. Ignambi; with 1849. Australia.

DOLICHOS LABLAB L. Paompai; creekside woods; 300 ft. 1878. Twiner. Widely distributed.

PONGAMIA GLABRA Vent. Hienghène; 1901. Estuarial mangrove swamps. Liane. Racemes erect. Standard erect. Petals white, tinged with rose. Scentless. Widely distributed.

MUCUNA (§ Amphiptera) NEOCALEDONICA Bak. fil., sp. nov. *Frutex* ramulis tenacissimis sec. cl. detectorem cortice griseo obtectis; *foliis* trifoliolatis foliolis ovatis basi cuneatis lateralibus inæquilateralibus superne pilis sparsissime vestitis apice acutis terminalibus 10–11 cm. longis, 7–8 cm. latis; *floribus* majusculis dependentibus in racemos laxos et paucifloros dispositis pedicellis calycem subæquantibus vel paullo longioribus; *calycis tubo* campanulato calyce in toto 13–16 mm. longo, extus tomento brevi rufescente obtecto dentibus brevibus obtusis vel subobtusis; *vexillo* 40–46 mm. longo, alis breviori; *alis* 60–65 mm. longis, carina brevioribus; *carina* longa recta 70–76 mm. longa, apice sursum curvata; *legumine* apice basique attenuato, plicis obliquis lamellato, 10–11 cm. longo, 4·5–5 cm. lato.

Ignambi; creekside forest; 1500 ft.; gneiss. Stem very tough. 1665 (Flowers). Tonine; forest; 500 ft. 1959 (Fruit). Flowers pendent. Petals yellowish white tinged with pink. Keel two-pointed, often outside the wings. Petiolules 5–6 mm. long. Allied to *M. imbricata* DC.

The distinguishing features of this plant are the ovate or broadly ovate leaflets with a cuneate base, the obtuse or subobtuse teeth of the calyx; the standard is distinctly shorter than the long narrow wings, and the keel is 6–8 mm. longer than the wings, the pod is obliquely lamellated and attenuate at both ends. Differs from *M. gigantea* DC. by the pod, etc.

M. PLATYPHYLLA A. Gray, var. nov. NEOCALEDONICA Bak. fil. *Frutex* scandens; *foliis* trifoliolatis foliolis terminalibus 12–12·5 cm. × 14–14·5 cm., quam in typo latioribus late orbicularibus paullo latioribus quam longis foliolis lateralibus 9·5–11 cm. latis, inæquilateralibus; *floribus* in paniculas laterales dispositis; *vexillo* ± 40 mm. longo, alis breviori; *carina* ± 50 mm. longa.

Baie Ba; cultivated area by creek sea-level. Mica schist. 1385. Liane.

Petals ivory-white, scentless. Calyx when young externally incano-tomentose 18-20 mm. long, lowest lobe longer and narrower. Wings 50–55 mm. long, 13–15 mm. broad. Differs from type, which comes from Fiji, by the broader leaflets.

DERRIS ULIGINOSA Benth. Port Ngéa, Nouméa ; littoral zone. 7. Woody climber and sprawling plant.

SOPHORA TOMENTOSA L. Cap N'dona ; littoral uncommon. 873. Small tree 15 ft. Grey-green leaves. Widely distributed.

CÆSALPINIA SEPIARIA Roxb. Ignambi; 1586. Weed especially by creeks and in wet places in lowland Niaouli districts ; 1000 ft. Shrub 8 ft. Corolla sulphur-yellow. Anthers orange. Widely distributed.

C. NUGA Ait. Oubatche. 1839. Littoral edge of mangrove swamp. Spreading bush. Flowers light yellow, scented. Widely distributed.

C. SCHLECHTERI Harms. Mont Canala. 1200. Small tree 20 ft. Leaves bright shining green, bipinnate. Flowers in terminal panicle. Calyx yellow, corolla yellow with orange blotch on standard. By streams in Niaouli regions, 1000 ft., and in intermediate forest. 1924 from Tonine is closely allied.

C. BONDUCELLA Fleming. Île Ouéré ; sandy littoral zone. 646. Flowers dingy yellow. Widely distributed.

STORKIELLA (§ Doga) COMPTONII Bak. fil., sp. nov. *Frutex* circ. 8-pedalis sec. cl. detectorem ; *foliis* imparipinnatis sæpius 3–4-jugis cum impari foliolis ellipticis vel oblongo-ellipticis 38–43 × 20–25 mm., basi subcordatis vel rotundatis subcoriaceis, costa subtus conspicua, nervis lateralibus tenuissimis petiolulis brevibus 3–5 mm. longis ; *floribus* luteis in paniculas densas et multifloras dispositis ; *sepalis* 4 in alabastris imbricatis 10–11 mm. longis, per anthesin initio subrectis demum reflexis ; *petalis* 12–15 mm. longis, linearibus ; *staminibus* 4 liberis filamentis filiformibus antheris linearibus basifixis loculis apice poro dehiscentibus 6–7 mm. longis ; *ovario* subsessili in fundo calycis libero pluriovulato ; *legumine* plano-compresso lignoso 1-spermo.

Poume ; occasional in scrub ; 400 ft. 2362. Flowers in dense clusters, bright orange-yellow, scentless; corolla, calyx and stamens all yellow. Fruit a flat woody pod with one black seed.

The distinguishing features of this shrub are the ovate-elliptical or elliptical leaflets broader than in *Storkiella Pancheri* Baillon and the dense panicles of orange-yellow flowers.

CLAVIS SPECIERUM.

Sect. I. **Eustorkiella** Baillon, Hist. Pl. ii. (1870) 189.
Stamina 10. *S. vitiensis* Seem. Fiji.
Sect. II. **Doga** Baillon in Adansonia, ix. (1869) 205.
Stamina 4.
* Foliola oblonga vel oblongo-lanceolata, 12–16 rarius 18 mm. lata. *S. Pancheri* Baillon. New Caledonia.
** Foliola elliptica vel ovato-elliptica, 20–25 mm. lata. *S. Comptonii* Bak. fil. New Caledonia.

CASSIA NEOCALEDONICA Vieill. Nouméa. 29. Shrub occasional along roadside, probably garden escape.

DESMANTHUS VIRGATUS Willd. Near Nouméa. 12. Abundant in hedgerows and waste places. Widely distributed.

LEUCÆNA GLAUCA Benth. Nouméa. 11 and 94. Roadsides and waste places. Widely distributed.

ACACIA LAURIFOLIA Willd. Anse Vata near Nouméa; littoral zone. 74. Tree 30 ft. Fiji.

A. SPIRORBIS Labill. Nouméa. Port Ngéa; woods, common. 20. Pods spirally coiled separately.

A. FARNESIANA Willd. Nouméa. 3. Very abundant on hillsides forming impassable thickets. Widely distributed.

PITHECOLOBIUM FOURNIERI Vieill. Tonine creekside; in forest, abundant; 1000 ft. 1926. Large spreading tree. Filaments crimson, anthers yellow. Perianth pale. Native name Poyes tribe "Ouayeno."

ALBIZZIA OBOVATA Benth. Mont Arago; frequent along forest margin; 800 ft.; mica schists. 1404. Small tree 20 ft. Filaments in some trees rosy, in others white. Strong not pleasant scent.

A. GRANULOSA Benth. Paompai; abundant in forest and by creeks; 50–1000 ft. 1906, Tree 40 ft., copiously branched, perianth yellowish green. Filaments white. Slight scent. River Tchiem; creekside, frequent; 200 ft. 1979. Large tree. Filaments white. Scented.

A. PAIVANA Fournier. River Tchiem; forest by streamside; 500 ft. 1989. Tree 30 ft. Leaves bipinnate of 8 segments. Corolla and filaments bright cerise. Scentless. Mont Canala; occasional in streamside woods; 1000 ft.; mica schists. 1422. Tree 30 ft. Corolla and filaments carmine, anthers yellow.

ALBIZZIA (§ Lophantha) COMPTONII Bak. fil., sp. nov. *Arbor* 20-pedalis ramulis adultioribus glabris cicatricibus foliorum delapsorum notatis novellis rufotomentellis; *foliis* mox glabrescentibus pinnis 3–4-jugis foliolis, 10–16-jugis oblongis 12–14 mm. × 3–4 mm., obtusis demum glabris basi parum inæquilateralibus; *floribus* in spicis 2·5–4·0 cm. longis densis cylindraceis dispositis; *pedunculis* rufo-tomentellis 2–3·5 cm. longis spicis subæquilongis floribus sessilibus; *calycis* dentibus acutis tubo 2–3-plo brevioribus calyce in toto 4 mm. longo; *staminibus* petalis longioribus 12–15 mm. longis basi coalitis; *ovario* glabro, stylo elongato tenuissimo.

Baie Ngo; streamside. 258. Tree 20 ft. Petals 8–9 mm. long.

This species is a tree allied to *A. lentiscifolia* Benth., but the calyx is distinctly longer, and the pairs of leaflets are more numerous.

SERIANTHES CALYCINA Benth. Baie Uie; above littoral zone on serpentine. 854. Tree 30 ft. Dark green leaves. Flowers large, perianth greenish. Filaments whitish pink, below crimson in distal half.

ROSACEÆ.

PARINARIUM NEOCALEDONICUM Bak. fil., sp. nov. *Frutex* vel *arbuscula* ramulis cortice cinereo vel atro-cinereo obtectis; *foliis* breviter petiolatis ellipticis vel ovato-ellipticis 4·5–5·0 mm. × 2–3 cm., apice obtusis vel leviter emarginatis coriaceis basi sæpissime late cuneatis; *inflorescentiis* dense paniculatis foliis brevioribus; *calycis lobis* erectis apice acutis; *petalis* vix 1·5 mm. longis albis calyce brevioribus; *staminibus* uno latere receptaculi confertis irregulariter dispositis; *ovario* ovoideo stylo subulato brevi tenui; *receptaculi* tubo fauce dense pilis retrorsis barbato; *fructu* ovoideo glabro 1 cm. longo.

Taom; frequent by creekside and in riverside woods; 300 ft. 2320. Shrub or small tree, hard wood. Corolla white. Sweet-scented. Petioles 2–4 mm. long. Calyx 3·5–4·0 mm. long.

Differs from *P. myrsinoides* Schlechter by its smaller leaves obtuse or emarginate at the apex, and shorter petioles.

P. MINUTIFLORUM Bak. fil., sp. nov. *Frutex* vel *arbuscula* ramis cortice cinereo obtectis; *foliis* coriaceis 3–5·5 cm. longis 18–25 mm. latis, ellipticis vel elliptico-ovatis, apice obtusis vel leviter emarginatis basi leviter subcordatis vel rotundatis, costa subtus prominula, nervis lateralibus tenuibus utrinque 10–12, petiolo 3–5 mm. longo instructis; *floribus* inter minores generis paniculatis paniculis 4–7 cm. longis, foliis longioribus pedicellis brevibus; *calyce* 1–1·5 mm. longo, extus pubescente lobis brevibus erectis tubo campanulato; *petalis* brevibus 1·5 mm. longis, apice obtusis; *staminibus* 5 brevibus uno latere receptaculi dispositis; *ovario* ovoideo, stylo brevi, receptaculi fauce pilis barbato.

Port Bouquet; on riverside serpentine scrub; 50 ft. 2245. Shrub or small tree. Flowers greenish, scentless.

Closely allied to *P. myrsinoides* Schlechter, from which it differs by its smaller obtuse or subemarginate leaves, with shorter petioles, by the pubescent inflorescence, the shorter calyx, and the greenish flowers.

CLAVIS SPECIERUM.

A. Folia 8–10 cm. longa. Petioli 10–15 mm. longi. *P. myrsinoides* Schlechter.

B. Folia minora, 3–5 cm. longa. Petioli breviores, 3–5 mm. longi.
- *a.* Folia basi subcordata. *P. minutiflorum* Bak. fil.
- *b.* Folia basi late cuneata. *P. neocaledonicum* Bak. fil.

RUBUS MOLUCCANUS L., var. NEOCALEDONICUS Schlechter. Mont Mou; weedy area derelict cultivation; 8000 ft. 560. Petals white. Drupels bright red.

SAXIFRAGACEÆ.

ARGOPHYLLUM SCHLECHTERIANUM Bonati & Petitmangin. Baie Ngo; abundant in serpentine scrub; 100 ft. 250. Shrub 6 ft. Inflorescence grey. Corolla yellow.

Var. nov. VESTITUM Bak. fil. *Frutex* circ. 6-pedalis ramis tomento brevi griseo vel cinereo indutis; *foliis* ellipticis vel oblongo-ellipticis superne nitidis subtus tomento brevi rufescente vel cinerascente vestitis margine sæpius ultra medium grosse serratis; *floribus* numerosis in cymas pedunculatas digestis.

Taom; frequent in serpentine scrub; 1000–2000 ft. 2298. Corolla bright yellow. Rest of inflorescence white downy. Scentless. Calyx albo-tomentose ±3 mm. long. Petals yellow, 4 mm. long.

A. NITIDUM Forst. Mt. Mou; damp gulley; 800 ft. 544. Mont Panié; gneiss. 1827. Shrub 8 ft., much branched. Corolla white. Flowers whitish on white-stemmed panicle. Scentless. Australia.

A. ELLIPTICUM Labill., var. nov. COMPTONII Bak. fil. *Frutex* 6-pedalis ramis rigidis cicatricibus foliorum delapsorum notatis; *foliis* obovatis vel ovatis 5·5–8·0 cm. × 4–5 cm., superne glabris subtus tomento brevi rufescente vel cinerascente instructis apice obtusis vel subacutis petiolis 10–15 mm. longis suffultis; *floribus* in cymas axillares dispositis; *calycis lobis* brevibus; *petalis* 5 intus luteis ±5 mm. longis, triangulari-ovatis; *ovario* semisupero stylo simplici.

Tonine; mountain top scrub; 3500 ft. 1938. Shrub 6 ft. Stems stiff, rough with leaf-bases. Inflorescence brown in all parts. Inside of petals bright yellow. Scentless. Flowers in pedunculate many-flowered panicles. Peduncle 3·5–6·5 cm. long.

Differs from type in the shape of the leaves, and differs from var. *obovatum* Guillaumin in the short tomentum on the under surface.

ARGOPHYLLUM LAXUM Schlechter, var. nov. SUBINTEGRIFOLIUM Bak. fil. *Frutex* circ. 8-pedalis; *foliis* ovatis vel elliptico-ovatis margine integris vel subintegris superne lucidis subtus pallide tomentosis 8–11 cm. × 4–6 cm.; *floribus* in paniculas laxissimas dispositis; *sepalis* albo-tomentosis oblongo-ovatis calyce in toto 3 mm. longo; *petalis* luteis ±4 mm. longis ovato-triangularibus; *stylo* simplici stigmate capitato.

River Ngoyé; lowland serpentine scrub by river; 400 ft. 2905. Inflorescence white. Corolla bright yellow.

Differs from type by the entire or subentire margins of the leaves.

GEISSOIS RACEMOSA Labill. Mt. Mou; cretaceous forest; 800 ft. 484. Tree 40 ft. Mont Dore; frequent in margins of stream valley woods; serpentine. 677. Tree 30 ft. Flowers on old wood and trunk. Honey disc, yellow. Perianth and filaments bright red.

G. MONTANA Vieill. Mont Humboldt; streamside in forest; 1500 ft.; serpentine. 1029. Small tree 30 ft. Inflorescence on old wood. Perianth green tinged with red. Filaments long, bright red. Style bright red. Ignambi; fairly frequent in forest; 2000–2500 ft.; gneiss. 1523. Shrub or small tree. Leaves sparse. Perianth dark red, filaments scarlet. Ovary disc yellow. Honeyed, scentless. Tonine Forest; 2500 ft. 1942. Trêe 25 ft. Flowers on old wood. Perianth cream-coloured, filaments and style crimson. Scentless. Ignambi Forest; 2000–3500 ft.; gneiss. 1704. Shrub or small tree. Ovary golden yellow.

G. MAGNIFICA Bak. fil., sp. nov. *Frutex* vel *arbuscula* circ. 25-pedalis; *foliis* oppositis ternatis foliolis pallide viridibus utrinque glaucis majusculis 20–21 cm. × 10–13 cm. obovatis, costa subtus prominula, nervis lateralibus utrinque 8–9 coriaceis petiolatis; *stipulis* magnis basi subcordatis; *floribus* speciosis rubris in racemos simplices laterales dispositis; *pedicellis* calyce longioribus 10–13 mm. longis glabris infra medium articulatis; *calycis lobis* 4 intus hirsutis extus glabris 6–7 cm. longis valvatis apice acutis; *petalis* 0; *staminibus* numerosis basi discis tenui hypogyni et crenulato insertis; *ovario* oblongo conico 2-mero stylis 2 elongatis basi connatis stigmatibus simplicibus; *capsulis* ignotis.

Cap Bocage; scrub and scrubby forest; serpentine. 1378. Leaves opposite, light green, glaucous on both sides. Inflorescence on old wood.

Calyx and filaments bright red. Scentless. Petiolules 2–4 cm. long. Pedicels 10–13 mm. long.

Noticeable on account of the ternate leaves with large obovate light green glaucous leaflets, the inflorescences on the old wood, and the bright red calyx and filaments and glabrous pedicels articulated below the middle.

CODIA MONTANA Forst. Mt. Dore; abundant on low serpentine hills; 100 ft. 658. Ignambi; frequent in dry Niaouli association; 1900–2000 ft.; gneiss. 1860. Shrub 3 ft. Leaves greyish green. Flowers dull white, sweet-scented. Poume; frequent in serpentine scrub. 2373. Shrub 6 ft. Leaves with yellowish veins and margins. Corolla greenish.

C. ALBIFRONS Vieill. River Ngoyé; undergrowth of *Spermolepis* forest by riverside; 500 ft. 970. Shrub 3 ft. Leaves dark green above, whitish below, with a brown tinge.

C. NITIDA Schlechter. Comboui Mts.; abundant in serpentine scrub; 1000 ft. 2199. Shrub or small tree. Flower-heads white. Anthers pale yellow.

C. INCRASSATA Pamp., var. nov. MAJOR Bak. fil. *Frutex* elatus vel arbuscula circ. 20-pedalis ramulis fusco- vel rufo-pubescentibus; *foliis* 7–11 cm. × 6–8 cm. late ovatis vel ovato-orbicularibus rigidis discoloribus, costa subtus prominente, nervis lateralibus utrinque 7–8; *floribus* in capitula globosa 15–20 mm. diam. bracteis 4 involucrata; *sepalis* 5 lanceolatis crassiusculis, externe dense lanatis.

Tonine (far side of); margin of forest and fougeres; 2500 ft. Mica schist. 1982. Flower-heads large, pinkish, slightly scented. Petioles short. Bracts 6–10 mm. long.

It differs from *C. incrassata* Pamp. by the larger leaves, the larger capitula, and the narrower sepals.

C. TINIFOLIA Bak. fil., sp. nov. *Fruticulus* circ. 2-pedalis ad *Pancheriam gatopensem* Vieill. accedens, ramulis cortice plumbeo vel cinereo obtectis; *foliis* sæpissime oppositis rigidis oblongis vel oblongo-oblanceolatis 5–6 cm. × 1·5–2·0 cm. margine recurvatis haud serratis pallide viridibus apice obtusis, costa subtus conspicua, petiolo brevi 3–5 mm. longo præditis; *floribus* in capitula 4–7 mm. diam. axillaria pedicellata glomeratis; *bracteis* parvis; *pedicellis* 8–18 mm. longis nunc solitariis nunc pedunculatis; *sepalis* scariosis; *petalis* scariosis; *staminibus* in floribus masculis 6–8, filamentis filiformibus, subulatis; *ovario* imperfecto; *floribus femineis* ignotis.

Tonine; scrub; 1200 ft. 2374. Small shrub 2 ft. Leaves stiff, light green, margins recurved. Flower-heads with white corolla and stamens. Sweet-scented.

This species, which is allied to *Pancheria gatopensis* Vieill., has light green glabrous leaves, resembling those of *Viburnum Tinus*. The margins are recurved, but not serrate. The capitula are small on slender pedicels.

CODIA FLORIBUNDA Brongn. & Gris. Taom; serpentine scrub 1500 ft. 2327. Shrub 3 ft. Leaves medium green, stiff, hard. Flowers white in spherical heads, sweet-scented.

PANCHERIA PINIFOLIA Brongn. & Gris. Ignambi; Niaouli association; 1000 ft. Gneiss. 1848. Small shrub 3 ft. Leaves shining above. Flower-heads greenish white, scentless. Leaves 3–4 cm. long, 10–17 mm. broad, petioles 2–3 mm. long. Heads of flowers 4–5 mm. in diameter. Petals 1·5 mm. long. Carpels 2 mm. long.

Noticeable on account of the rather small ternate verticillate elliptical or oblong-elliptical leaves and small heads of flowers.

P. RUBRIVENIA Bak. fil., sp. nov. *Frutex* circ. 6-pedalis ramulis validis cortice plumbeo vel cinereo obtectis; *foliis* rigidis 5–7 cm. × 2·5–4·0 cm. verticillatis ellipticis vel ovato-ellipticis margine recurvatis et serratis costa subtus prominente nervis lateralibus 7–9 marginem versus furcatis et inter se conjungentibus, petiolo 2–4 mm. longo crasso præditis; *floribus* in capitula sphærica ±10 mm. diam. pedunculata glomeratis; *pedunculis* fusco- vel rufo-tomentosis erectis 2·5–3·5 cm. longis; *capitulis* involucratis; *bracteis* ovatis acuminatis; *petalis* ellipticis scariosis margine ciliatis; *staminibus* 6–8 exsertis; *ovario* imperfecto.

Tonine; mountain-top scrub; 3500 ft. 1935. Shrub 6 ft. Stems hard. Leaves stiff, dark green, reddish nerve, edges recurved somewhat puckered. Flowers on erect peduncles tinged with pink. Strong-scented.

Noticeable on account of the stiff, glabrous, elliptical, or ovate-elliptical, shortly petiolate leaves, with reddish nerves. The capitula are on erect fusco- or rufo-tomentose peduncles. In this species the capitula are involucrate, but the leaves are whorled and serrate.

P. PINNATA Vieill. Plaine des Lacs; abundant on moderate slopes; 800 ft.; serpentine. 306. Shrub 6 ft., simple unbranched stem. Leaves in whorls of three. Flower-heads white.

P. LANCEOLATA Vieill. Poume; serpentine scrub; 500 ft. 2382. Shrub 5 ft. Leaves light green, midribs reddish yellow. Perianth brownish, filaments white.

P. COMMUNIS Bak. fil., sp. nov. *Frutex* circ. 5-pedalis; *foliis* coriaceis glabris 20–25 mm. × 11–15 mm. quaternatim verticillatis oblongo-obovatis margine apicem versus serratis nervis lateralibus 5–6 marginem versus arcuatis et inter se conjungentibus, petiolis 1–2 mm. longis præditis;

floribus albis glomerato-capitatis; *pedunculis* strictis foliis longioribus; *floris masculi* sepalis membranaceis ±2 mm. longis oblanceolatis vel oblongo-oblanceolatis; *petalis* membranaceis 3 mm. longis calyce longioribus albis; *staminibus* glabris exsertis; *carpellis* in floribus femineis extus pubescentibus, stylis brevibus erectis.

Plaine des Lacs; the most abundant shrub on the level plain. Serpentine scrub. 340. Diameter of flowering heads 8–10 mm., when fruiting 12 mm.

A shrub allied to *P. alaternoides* Brongn. & Gris, but the leaves are cuneate-obovate, and the petioles very short.

Pancheria obovata Brongn. & Gris. Plaine des Lacs; abundant over dry serpentine slopes in scrub. 372. Shrub. Flower-heads white. Mt. Nekando; 1081. Shrub 8 ft.

The following may also probably belong here:—

Baie Ngo; 257. Common in serpentine scrub; 200 ft. Shrub 6 ft. Flowers white, sweet scent.

P. Vieillardii Brongn. & Gris. Mont Mou; margin of forest or scrub; 1800 ft.; serpentine. 431. Shrub or small tree. Flowers white. River Ngoyé; river-margin among rocks. 2048. Leaves stiff, hard, medium green.

P. elegans Brongn. & Gris. River Dumbéa; abundant in flood plain; serpentine. 407. Flower-heads white. Shrub. River Kuakué; abundant among boulders along river-margin; serpentine; 100 ft. 899. Shrub 5 ft. Young stems reddish. Leaves dark green, shining above, almost glaucous beneath. Flower-heads white, scented. River Ngoyé; 2110.

P. alaternoides Brongn. & Gris. River Comboui; frequent in scrub on riverside serpentine alluvium; 100 ft. Shrub 8 ft. Buds pink. Corolla and filaments white. Sweet scent. Specimens from different branches growing close together showing variation in foliage. Baie Ngo; serpentine scrub; 265. Uncommon.

P. ternata Brongn. & Gris. Taom. Abundant in serpentine scrub; 500–2000 ft. 2295. Shrub 5 ft. Perianth reddish. Filaments white. Sweet scent.

P. Engleriana Schlechter. Nekando; scrubby coniferous forest; 3500 ft. Serpentine. 2023. Shrub 10 ft. Leaves red when young. Perianth red. Filaments white. Anthers pale yellow, scentless. Mts. north of River Ngoyé; upland serpentine scrub; 3000 ft. 2068. Shrub 10 ft. Filaments white. Anthers brown.

Weinmannia dichotoma Brongn. & Gris. Mont Mou; Coniferous forest; 3500 ft. 581 and 626. Tree 30 ft. Flowers white, scentless. Mt. Arago;

along streams in moist forest region. 1417. Tall tree 60 ft. Mont Canala; streamside woods, Niaouli region; 1000 ft. 1249. Tall tree 60 ft. Flowers pure white on green axis. Also from Ignambi, 1720, and Mont Panié, 1758.

CUNONIA PURPUREA Brongn. & Gris. River Ngoyé; creekside serpentine scrub area; 300 ft. 2099. Spikes long. Corolla rosy-pink. Filaments crimson. Anthers black. Scentless. River Ngoyé; riverside scrub, serpentine; 300 ft. 2146. Shrub or small tree. Short spikes. Pink corolla. Crimson filaments. River Dumbéa; river-banks; 200 ft.; serpentine. 828. Shrub 8 ft., stiff erect branches, and erect inflorescences. Flower dull red, petals reflexed. Stamens spreading.

The following are allied to *C. purpurea* Brongn. & Gris. River Ngoyé; riverside serpentine scrub; 200 ft. 2131. Small tree very like 2099 in vegetation characters, but the flowers are pure white except for pale green calyx and crimson anthers. Faint scent. River Ngoyé; riverside serpentine scrub; 200 ft. 2131. Small tree very like 2131, except that the white spikes are only half the length and the other leaves are all trifoliate.

C. MONTANA Schlechter. Mont Mou; forest margin; 350 ft. 624. Shrub 6 ft. Flowers white, anthers red. Nekando; forest; above 3000 ft., serpentine. 2022. Shrub or small tree. Corolla white, reflexed. Ovary pale green. Anthers brown. Scentless.

C. PTEROPHYLLA Schlechter. Nekando; forest; 3000 ft.; serpentine. 2028. Tree 30 ft. Leaves shining above, paler beneath, margins irregularly reflexed. Anthers red, when young brown, after dehiscence. Slight scent.

CUNONIA LATIFOLIA Schlechter. Tonine; forest margin; 3500 ft. 1977. Small tree 25 ft. Flowers white, scentless.

C. ATRORUBENS Schlechter. Mountains north of River Ngoyé; margin of *Casuarina* forest and scrub; 3000 ft.; serpentine. 996. Tall shrub 12 ft. Leaves with red veins and margins. Capsule reddish. Mont Dore; abundant on stony hillsides and in upland scrub above 1000 ft. 684. Shrub 8 ft. Leaves yellowish green beneath. Flowers deep red.

C. VIEILLARDII Brongn. & Gris. Presqu'île Bogota; dry serpentine scrub; 1000–2000 ft. 1319. Shrub 3 ft. Light green leaves, red veins. Flowers dark rose-coloured, scentless. Mts. to north of River Ngoyé; *Casuarina* forest especially near edge; 3000 ft., serpentine. 993. Tree or shrub 30 ft. Flowers bright rose-pink. Anthers black. Scentless.

C. MACROPHYLLA Brongn & Gris. Plaine des Lacs; moderate slopes especially where slightly moist; 1000 ft., serpentine. 308. Stems, petioles, and stipules red, the stipules often very waxy when old.

SPIRÆANTHEMUM COMPTONII Bak. fil., sp. nov. *Arbor* ramulis glabris; *foliis* majusculis verticillatis oblongo-oblanceolatis vel anguste obovatis 12–16 cm. × 3–6 cm. supra viridibus subtus pallidioribus, costa superne impressa, nervis lateralibus utrinque 5–8 subtus subprominulis apice obtusis vel subobtusis basi in petiolum brevissimum angustatis; *floribus* in paniculas axillares dispositis; *paniculis* 5–8 cm. longis sæpe foliis brevioribus; *calyce* ±2 mm. longo tubo brevi lobis oblongis; *staminorum filamentis* filiformibus antheris brevibus; *folliculis* pubescentibus calyce duplo longioribus apice in stylum gradatim attenuatis, cum stylis 3–4 mm. longis.

Plaine des Lacs; forest of sheltered valley; 1200 ft. 353. Flowers pinkish.

The noticeable features of this species are the verticillate glabrous rather large leaves, and the short panicles of flowers.

S. RUBESCENS Bak. fil., sp. nov. *Frutex* bimetralis sec. cl. detectorem ramulis longitudinalis striatis; *foliis* parviusculis 5–7 cm. × 2–3 cm. subcoriaceis glabris ellipticis vel oblongo-ellipticis apice obtusis basi in petiolum 8–12 mm. longum angustatis, costa superne impressa, nervis lateralibus 6–7; *floribus* in paniculas 2–3 cm. longas et axillares dispositis; *paniculis* foliis brevioribus; *calyce* ±1·5 mm. longo tubo brevi lobis brevibus; *staminorum filamentis* filiformibus antheris minutis; *folliculis* pubescentibus 2–2·5 mm. longis calyce duplo longioribus.

Mt. Koghi; frequent in open serpentine scrub; 2000 ft. 735. Shrub 6 ft. Carpels going reddish on ripening.

The noticeable features of this species are the whorled elliptical or elliptical-oblong petioled leaves, and the small axillary panicles of flowers shorter than the leaves. The rachis of the inflorescence is pubescent.

This differs from *S. vitiense* A. Gray from Viti, but it closely resembles the plant which has been referred to this species from New Caledonia.

S. ELLIPTICUM Vieillard. Mont Mou; coniferous forest; 3500 ft. 620. Tree 25 ft. Fruits reddish.

The following probably also belongs here. Mont Mou; 499. Dry upland serpentine scrub; 3500 ft. Monœcious male flowers pale. Ovaries reddish. Shrub 6 ft.

S. UNDULATUM Vieillard. Paompai; creekside woods; 100 ft. 1867. Tree 30 ft. Smooth bark, widely spreading branches. Flowers pale greenish white.

POLYOSMA PODOPHYLLA Schlechter. Tonine Forest; 2000–3000 ft. 1941. Tree 25 ft. Flowers white, slightly scented. Corolla reflexed.

P. COMPTONII Bak. fil., sp. nov. *Frutex* vel *arbuscula* ramulis cortice cinereo obtectis; *foliis* ellipticis vel lanceolato-ellipticis 3–6·5 cm. × 1·5–2·0 cm. viridibus margine remote serratis vel undulatis apice acutis basi late cuneatis, nervis lateralibus tenuibus marginem versus arcuatis et inter se conjungentibus, petiolo mediocri 8–10 mm. longo præditis; *spicis* 3–5 cm. longis axillaribus petiolo 2–3-plo longioribus laxe floriferis; *floribus* albis suaveolentibus; *calyce* turbinato ±1·5 mm. longo segmentis breviter triangularibus parvulis; *petalis* angustis 4 mm. longis lineari-oblongis; *stylo* subulato 2·5 mm. longo tenui dense piloso stigmate parvulo subcapitato.

Comboui Mts.; scrubby coniferous forest; 3500 ft.; serpentine. Shrub or small tree. 2178. Leaves medium green, midrib reddish below. Calyx and corolla creamy-white, petals spreading. Sweet-scented.

EUCRYPHIACEÆ.

PARACRYPHIA Bak. fil., gen. nov.

Perianthii segmenta 2 imbricata, extus hirta, concava, subcalyptratim caducissima. *Stamina* 8–10, subperigyna, antheris longitudinaliter dehiscentibus basifixis, flavis, filamentis post anthesin accrescentibus. *Ovarium* liberum, extus hirtum, 12–15 loculare, multiovulatum, ovulis in loculis paucis, angulo centrali 1-seriatim affixis. *Capsula* e valvulis 12–15 septicide dehiscentibus sistens, valvulis ab axi placentifero præter apicem solutis oligospermis.

Frutex vel *arbuscula* usque ad 20-pedalis. *Folia* simplicia fere glabra, coriacea, margine serrata, basi in petiolum attenuata, apice subacuminata, verticillata vel subverticillata. *Flores* superiores hermaphroditi, inferiores masculi, parviusculi, in paniculas dispositi, ramis ferrugineo-hirtis (Pl. **18**).

Allied to *Eucryphia*, but differing in the perianth, the character of the inflorescence, and the sessile stigmas. It agrees, however, as was kindly pointed out to me by Miss Gibbs, in the manner of dehiscence of the capsule, the valves of which dehisce septicidally and separate from the central axis, being only attached at length by two strands at the very apex. The ovary is 12–15-locular, the ovules being uniseriate and axile.

PARACRYPHIA SUAVEOLENS, sp. nov. *Frutex* vel *arbuscula* 6–7-metralis ramulis cortice cinereo obtectis; *foliis* oblanceolatis vel oblongo-oblanceolatis 5–11 cm. × 12–30 mm. margine serratis coriaceis apice subacuminatis superne demum glabris, costa subtus conspicua, nervis lateralibus tenuibus, petiolis crassiusculis 10–20 mm. longis; *floribus* parviusculis in paniculam dispositis ramis ferrugineo-hirtis 3–4 cm. longis; *perianthii segmentis* concavis extus ferrugineo-hirtis caducissimis; *staminibus* 8–10 antheris 3–4 mm. longis longitudinaliter dehiscentibus filamentis post anthesin accrescentibus; *ovarii loculis* 12–15; *capsulis* septicide dehiscentibus 7–8 mm. longis valvulis oligospermis, 1–1·5 mm. latis.

Ignambi; forest; 3000–3500 ft.; gneiss. 1515. Leaves yellowish green. Perianth of brown scales, caducous; 8–10 stamens; filaments enlarged after

flowering (gall or abnormality). Sweet scent. Mt. Panié; forest; 1500 ft. 1772. Small tree 15 ft. Leaves drooping, red-toothed. Perianth of brown scales, caducous. Anthers yellow.

CRASSULACEÆ.

Bryophyllum calycinum Salisb. Nouméa; abundant on roadside around town. 9. Widely distributed.

DROSERACEÆ.

Drosera neocaledonica Hamet. Mts. to north of River Ngoyé; bare serpentine earth; 0–3500 ft. 2093. Herbaceous perennial; rosettes glandular, hairs red, rest of leaf pale green. Calyx and pedicels red. Corolla white, widely open, quickly withering.

RHIZOPHORACEÆ.

Rhizophora mucronata Lam. Nouméa, Port Ngéa; wettest part of mangrove swamp; 1*a*. Tree 22 ft. Petals white. Calyx light green. Viviparous. Wood very hard. Nouméa, Port Ngéa; mangrove swamps; 1. Tree 25 ft. Widely distributed.

Crossostylis grandiflora Brongn. Mont Mou; streamside in damp gulley; 600 ft., cretaceous; 552. Tree 30 ft. Adventitious roots from lowest 4 ft. of trunk not usually reaching ground. Fruit mucilaginous inside.

LYTHRACEÆ.

Sonneratia alba Sm. Ouen Toro; 80. Mangrove aerating roots up to 9 in. in diameter branching at top, projecting about 1 foot from soil. Perianth greenish outside. Stamens incurved in bud, falling off early. Style long, bent, tubular, apical ring stigma. Australia, Java, etc.

COMBRETACEÆ.

Terminalia rubricarpa Bak. fil., sp. nov. *Arbor* humilis 15-pedalis sec. cl. detectorem ramis cortice cinereo obtectis et cicatricibus foliorum delapsorum notatis; *foliis* suborbicularibus vel obovato-suborbicularibus 7–11 cm. × 8–11·5 cm. sæpe paullo latioribus quam longis apice truncatis vel emarginatis basi rotundatis glabris, nervis lateralibus 7–10 patentibus vel erecto-patentibus, petiolo brevissimo 3–4 mm. longo suffultis; *floribus* delapsis; *fructu* ovoideo apice acuminato 2 cm. longo, 10–13 mm. lato endocarpio durissimo, seminibus solitariis.

Port Ngéa, Nouméa; littoral; 5. Fruit bright red, exocarp fleshy, endocarp very hard, thick, spongy, one central flat seed. Rachis of inflorescence 7–8 cm. long.

Belongs to Section Myrobalanus. Allied to *T. littoralis* Seem., but this has narrower leaves and different fruit.

MYRTACEÆ.

Bæckea virgata Andr. (*Leptospermum parvulum* Labill.) Riv. Dumbéa; abundant; flood plain. 404. Tonghoué Mts.; dry Niaouli hillsides. 162. Mt. Mou; cretaceous and serpentine scrub. 636. Ignambi; abundant in drier parts of Niaouli association; 1000 ft. 1845. Small shrub 2 ft. Flowers white, the centre greenish when young, red when old. Slight scent. Also from Taom; 2307.

B. pinifolia DC. (*Leptospermum pinifolium* Labill.) Mt. Canala; on rocks on open parts of stream; 900 ft. and in dry Niaouli association; 1167. Shrub 4 ft. Mont Panié; Niaouli association; 1200 ft. Gneiss. 178. Shrub 4 ft. Flowers white.

B. ericoides Brongn. & Gris. Plaine des Lacs; 349. Shrub 6 ft. 269 from Baie Ngo is probably a form of this species.

Callistemon suberosum Brongn. & Gris. Plaine des Lacs; 318. Low shrub on moderate slopes.

Melaleuca viridiflora Soland. Near Nouméa; 15 m. Very abundant tree covering hillsides. The Niaouliué. Tonghoué Mts. Forming woods on dry hillsides; 0–2500 ft. 160. Ignambi; abundant on hillsides; 0–2500 ft. 1718. Niaouli association. Tree 40 ft. Australia, Indian Archipelago, Malay Peninsula.

M. gnidioides Brongn. & Gris. River Ngoyé (Mts. to N.W.). Shrub abundant in scrub; 2500 ft. Enters the *Casuarina* Forest at about this level as a tree. 998. Shrub or tree sometimes 40 ft. When a shrub, general shape a cone standing on its apex. Leaves small, hard, dark green. Stem with papery bark. Fruits sessile, reddish. Mts. to north of Ngoyé; dry serpentine scrub and occasionally on bare crests; 2000 ft.; 2071. Flowers yellowish green, scentless. Also from Poume; 2375.

M. acicularis Brongn. & Gris. Plaine des Lacs; dry slopes; 316. Shrub 6 ft.

Tristania callobuxus Niedenzu. Baie Ngo; common on scrub; 50 m.; 248. Shrub or small tree. River Dumbéa; frequent along river-banks; 200 ft.; serpentine mountain region; 819. Shrub 6 ft. Dull golden-yellow flowers, honeyed, sweet-scented. Baie Kuakué; frequent in scrub; 1000 ft.; 887. Flowers erect, yellow, honeyed.

T. glauca Pancher. Plaine des Lacs; dry slopes; 317. Baie Kuakué; the most abundant shrub in the scrub; 0–1000 ft.; just past flowering, 882. Shrub 8 ft. Light green, stiff leaves with yellowish-red midrib and edge. Terminal corymbs of small yellow sweet-scented flowers. Fruit spherical.

TRISTANIA GUILLAINII Heck. Cap Bocage; scrub; 900 ft. 1397. Shrub 4 ft. Leaves stiff, medium green. Flowers yellow, 4 petals, 5 clusters of stamens opposite petals.

CLAVIS SPECIERUM CLŒZIÆ.

A. Flores axillares, solitarii. Folia elliptica, coriacea, supra vernicosa.
C. buxifolia Brongn. & Gris.

B. Flores in cymas pluri- vel multi-floras dispositi.
  a. Folia subtus canescentia vel cinereo-velutina.
    * Folia elliptica, coriacea. Calycis lobi 4 mm. longi. Petala oblongo-lanceolata. *C. Deplanchei* Brongn. & Gris.
    ** Folia lanceolata vel elliptico-lanceolata. Calycis lobis ±2·5 mm. longi. Petala obovata. *C. canescens* Brongn. & Gris.
    *** Folia ovato-elliptica vel elliptica, obtusa. Calycis lobi 3·5 mm. longi. Petala ovato-lanceolata.
C. Comptonii, sp. nov.
    **** Folia angustiora, lineari-oblonga. Calycis lobi ±2·5 mm. longi. Petala oblongo-lanceolata. *C. angustifolia*, sp. nov.
  b. Folia glabra.
    * Folia elliptica, breviter petiolata. Cymæ multifloræ.
C. floribunda Brongn. & Gris.
    ** Folia ovata vel ovato-oblonga, sessilia. Cymæ plurifloræ.
C. sessilifolia Brongn. & Gris.
    *** Folia elliptica vel lanceolata, breviter petiolata, supra vernicosa.
C. ligustrina Brongn. & Gris.

Bæckea nelitroides Seem. is also a species of *Clœzia*. The earliest name for the genus is *Mooria* Montrouzier, 1860.

CLŒZIA COMPTONII Bak. fil., sp. nov. *Frutex* 6-pedalis ramis teretibus ramulis novellis canescentibus; *foliis* ellipticis vel ovato-ellipticis 3·5–4 × 1·5–2·0 cm. apice obtusis vel rarius subacutis subtus primum canescentibus, petiolo 1–1·5 mm. longo brevissimo suffultis, nervis lateralibus subtus prominulis; *cymis* axillaribus 1·3–1·8 cm. longis paucifloris pedunculis calycibusque canescentibus; *calycis* tubo 4–4·5 mm. longo turbinato lobis angustis 3–3·5 mm. longis lineari-lanceolatis; *petalis* ovato-lanceolatis brevissime unguiculatis 3–5 mm. longis flavescentibus; *fructu* ignoto.

Mt. Dore; *Casuarina* association in stream-bed; 200 ft.; rare. 703. Shrub 6 ft. Flowers dull yellow.

Allied to *C. Deplanchei* Brongn. & Gris and *C. canescens* Brongn. & Gris. A shrub about 6 ft. high with ovate-elliptical obtuse leaves, and few-flowered canescent cymes shorter than the leaves. The flowers are dull yellow.

Clœzia angustifolia Bak. fil., sp. nov. *Frutex* 6–8-pedalis ramis subteretibus sursum bene foliatis deorsum cicatricibus foliorum delapsorum notatis; *foliis* lineari-oblongis vel lineari-oblanceolatis superne glabris 4–5 cm. longis 8–13 mm. latis, subtus canescentibus apice obtusis vel subacutis basi in petiolum 3–4 longum attenuatis; *floribus* in cymas axillares plurifloras vel multifloras dispositis cymis foliis 3-4-plo brevioribus; *calyce* 5 mm. longo tubo extus canescenti-pubescente lobis triangulari-acutis 2·5 mm. longis; *petalis* pallide flavis ±3 mm. longis calyce paullo longioribus extus pubescentibus oblongo-lanceolatis; *staminibus* inæqualibus; *ovario* extus pubescente 4–5-ovulato, stylo erecto.

Cap Bocage; serpentine scrub; 100–1300 ft.; abundant. 1375. Shrub 6–8 ft. Dense growth. Corolla pale yellow.

Allied to *C. canescens* Brongn. & Gris, differs by the narrower leaves and by the oblong-lanceolate petals. Differs from *C. Deplanchei* Brongn. & Gris by the narrower leaves and the calyx having shorter lobes.

C. floribunda Brongn. & Gris. Mont Koghi; serpentine scrub; 2000 ft. 737. Shrub 6 ft. Flowers honeyed, sweet-scented. Corolla dull yellow. Kuakué; abundant in lowland scrub 0–1000 ft. 936. Shrub 8 ft. Leaves yellowish green. Fruit dull red, abundant. Port Bouquet; creekside serpentine scrub-area; 100 ft. 2250. Shrub 4 ft. Twigs slender, flexible. Corolla and calyx teeth yellow.

C. ligustrina Brongn. & Gris. River Dumbéa; woods just above stream; 200 ft. Shrub 4 ft. The following also probably belongs here:—Kuakué; scrubby forest above river; 100 ft.; serpentine. 948. Small tree 20 ft., laxly branched with light green leaves.

Metrosideros operculata Labill. Ignambi; frequent in stony creeks in Niaouli area; 100 ft.; gneiss. 1660. Shrub 6 ft., branching copiously. Leaves dark green, shining above, dotted below. Perianth green, stamens white, anthers yellow. Scentless.

M. laurifolia Brongn. & Gris. Mt. Mou summit; 3800 ft.; scrub. 488.

M. nitida Brongn. & Gris. Ignambi; scattered throughout forest; 2500–4200 ft.; gneiss. 1516. Tree 30 ft., bushy rounded growth. Flowers copious, scentless. Calyx green-yellow. Corolla and filaments brilliant scarlet. Whole tree very conspicuous.

M. intermedia Vieill. Tonine; west side, forest margin; 2000 ft.; mica schists. 1980. Corolla pinkish before opening. Style and filaments white. Slight scent.

METROSIDEROS OPERCULATA Labill., var. MYRTIFOLIA Brongn. & Gris. Mt. Nekando; upland shrub; 3000 ft.; frequent. 1075. Shrub 8 ft. Stiff regularly arranged leaves. A form of this variety with the lamina of the leaves 9–11 mm. long and 5–7 mm. broad, the petioles being 1–2 mm. long. Calyx 5–6 mm. long, the lobes being 3–4 mm. long. Guillaumin also considers *Metrosideros Francii* Schlechter, a form of *M. operculata* Labill. (Not. Syst. i. 109.)

XANTHOSTEMON MULTIFLORUM Beauv. forma FLAVUM Pamp. R. Dumbéa; river-banks, infrequent; 100 ft.; plains region. 823. Tree 20 ft. Hard, leathery, retuse leaves. Flowers with very pale yellow corolla and much deeper yellow staminal filaments.

X. MYRTIFOLIUM Guillaumin. R. de Carènage. 375. Shrub 6 ft.; frequent along river-banks.

X. INTEGRIFOLIUM Bak. fil., comb. nov. (*Fremya integrifolia* Brongn. & Gris.) R. Dumbéa; river-banks, uncommon; 200 ft. 826. Shrub 6 ft. Small hard leaves with thickened margins. Erect flowers, white corolla with pale yellow filaments.

X. BEAUVISAGEI Pamp., var. nov. POUMENSIS Bak. fil. *Frutex* 6-pedalis ab typo differt; *calycis lobis* ovatis apice rotundatis; *petalis* pallide flavis.

Poume; lowland scrub creekside; 50 ft. 2384. Shrub 6 ft. Leaves stiff, hard, dark green. Calyx green. Stamens and corolla pale yellow. Scentless, honeyed.

X. AURANTIACUM Heck. Plaine des Lacs; abundant shrub on gentle and moderate slopes; 0–250 ft. 310.

X. CILIATUM Niedenzu. Poume; abundant in serpentine scrub; 500–1000 ft. 2360. Low shrub 2 ft., spreading habit. Flower with green calyx, crimson corolla and filaments. Fruit red when ripe. Ignambi; Niaouli association; 1000 ft. 1859. Small shrub 2 ft. Leaves small, medium green, shining above, very stiff. Fruit 3 carpels, dull red.

X. RUBRUM Niedenzu. River Comboui; scrubby woods, serpentine; 100 ft., occasional. 2012. Small tree 20 ft. Broad, flat, shining receptacle. Petal vivid crimson. Style and filaments the same. Scentless.

RHODOMYRTUS EMARGINATA Pancher in herb. Mt. Dore; in scrub; 2500 ft. 698. Shrub 3 ft. Flowers white. Leaves, lamina 12–20 mm. long, 8–12 mm. broad; petioles 2 mm. long. Calyx ±4 mm. long. Petals 5–5·5 mm. long, concave.

MYRTUS PROLIXA Bak. fil., sp. nov. *Arbor* 20-pedalis ramis teretibus vel subteretibus; *foliis* 4–6·5 cm. × 17–32 mm. ovalibus vel oblongo-ellipticis in sicco luteo-viridibus apice obtusis basi cuneatis, costa subtus conspicua, nervis lateralibus tenuibus subtus prominulis, petiolis 3–5 mm. longis; *floribus* albis suaveolentibus pedicellatis pedicellis strictis axillaribus; *bracteolis* minimis; *calyce* 3 mm. longo, tubo brevi turbinato lobis 5 suborbicularibus demum reflexis; *petalis* 5 suborbicularibus 5 mm. longis; *staminibus* antheris minimis; *stylo* erecto filiformi; *ovario* triloculari.

Plaine des Lacs; Kaori forest, in sheltered valley; 800 ft.; serpentine. 393. Tree slender and lanky. Flowers white, sweet-scented. Allied in some respects to *M. Vieillardii* Brongn. & Gris. A tree with oval or oblong-elliptical yellowish-green subcoriaceous petiolate glabrous leaves and pedicellate axillary flowers, with a trilocular ovary.

MYRTUS LUTEO-VIRIDIS Bak. fil., sp. nov. *Frutex* 4-pedalis ramulis cortice atro-cinereo obtectis; *foliis* coriaceis flavo-viridibus ellipticis vel ovato-ellipticis 3·5–4·5 cm. × 1·8–2·8 cm. apice sæpius emarginatis, costa subtus conspicua, nervis lateralibus tenuibus, petiolis 4–5 mm. longis; *floribus* pentameris paniculatis cymosis pedicellatis cymis folio brevioribus; *calycis tubo* subgloboso lobis obtusis; *petalis* albis calyce longioribus; *staminibus* numerosis; *ovario* 2-loculari; *fructu* globoso in sicco nigrescente.

River Ngoyé, Mts. to N.W.; scrub; 2500 ft. 1002. Shrub 4 ft. Leaves light yellowish green, stiff. Flowers white, scented. Fruit spherical. A shrub with elliptical or ovate-elliptical coriaceous yellowish-green petiolate leaves and cymes of pentamerous flowers. The fruit is spherical, the embryo curved.

M. RUFO-PUNCTATA Pancher. Mt. Mou; serpentine; 3000 ft., dry scrub. 627. Plaine des Lacs. 269. Shrub 4 ft.; dry slopes. Taom; frequent in upland serpentine scrub; 2500–3000 ft. 2330. Shrub 4 ft., much branched with dense foliage. Leaves glandular. Flowers white, scentless.

M. PAITENSIS Schlechter. River Ngoyé; riverside scrub; 400 ft.; serpentine. 2109. Shrub 6 ft. Stems reddish when young, thin, soft, slightly stiffened. Corolla ivory or greenish, widely open. Slight sweet scent.

M. NGOYENSIS Schlechter. Baie Kuakué; occasional in scrub; 1000 ft. 884. Shrub 6 ft. Copious dark green leaves, lighter beneath, with recurved margins. Flowers pendent, solitary, white, honeyed, sweet-scented.

M. VIEILLARDII Brongn. & Gris. Taom; lowland serpentine scrub; 400 ft. 2934. Shrub 3 ft. Leaves light green, shiny, petioles and young stem reddish. Flowers green. Calyx white, corolla sweet-scented.

EUGENIA. I have arranged the species in this collection under the following four sections:—

I. **Eueugenia.** Flowers solitary or in fascicles. Petals distinct.

II. **Jambosa.** Inflorescence cymose. Calyx usually with a thickened staminal disc. Flowers showy, usually 4-merous. Petals free and spreading.

III. **Syzygium.** Flowers small, in compact cymes. Petals usually calyptrate. Berries small.

IV. **Cupheanthus.** Flowers very large, showy, in few-flowered cymes. Calyx-tubes very long. Petals calyptrate. Small or large trees with large leaves.

EUGENIA (§ Eueugenia) GYROSEPALA Bak. fil., sp. nov. *Frutex* 3-pedalis ramulis cortice cinereo obtectis; *foliis* parviusculis oblongo-ellipticis vel oblongo-obovatis 2–3 cm. longis 12–20 mm. latis, glabris, apice sæpius emarginatis, costa subtus conspicua, nervis lateralibus haud conspicuis, petiolo brevissimo ± 2 mm. longo suffultis; *floribus* albis solitariis vel subsolitariis axillaribus pedicellatis; *calycis tubo* brevi ad basin bracteolato lobis 4 obtusis; *petalis* albis; *staminibus* numerosis stylo erecto tenui; *ovario* biloculari.

River Ngoyé; among stones in river-bed. 958. White flowers, reddish buds, hard pent leaves.

A shrub with small leaves and solitary or subsolitary flowers and 4-lobed calyx, allied to *E. carissoides* F. v. Muell., from Queensland. 301 from Plaine des Lacs is closely allied.

E. ANGUSTIBRACTEOLATA Bak. fil., sp. nov. *Frutex* 5-pedalis ad *E. Pancheri* Brongn. & Gris accedens, ramulis glabris cortice atro-purpureo obtectis; *foliis* 4–7 cm. longis 2·5–4·0 cm. latis crassiusculis ovatis apice acutis basi late cuneatis in petiolum 3–4 mm. longum attenuatis, nervis lateralibus crebris supra prominulis, costa subtus prominente; *floribus* albis cymosis cymis ramosis axillaribus et terminalibus folia haud æquantibus; *calycis tubo* 2·5–3·0 mm. longo, campanulato pubescente lobis 2 mm. longis; *bracteolis* ad basin calycis linearibus tubo brevioribus calycis lobis 5 persistentibus obtusis; *petalis* albis 4·5–5 mm. longis concavis.

Presqu'île Bogota; occasional in dry serpentine scrub; 1500 ft. 1339. Shrub 5 ft. Corolla white, the buds patched with red. Faint sweet scent.

Compared at the Paris Herbarium. Allied to *E. Pancheri.* Differs in the ovate acute leaves, the nerves not being so prominent below, and the two bracteoles below the calyx are linear. The five calyx-lobes are persistent.

E. (§ Eueugenia) MOUENSIS Bak. fil., sp. nov. *Arbor* ramis teretibus cortice cinereo obtectis; *foliis* oblongis vel oblongo-lanceolatis vel elliptico-

oblongis 15–20 cm. longis 5–6·5 cm. latis, utrinque opacis apicem versus attenuatis basi late cuneatis vel subrotundatis, petiolis 3–5 mm. longis; *floribus* albis e trunco ortis brevissime pedicellatis; *calycis tubo* turbinato glabro 4 mm. longo, lobis 4 persistentibus 3–4 mm. longis obtusis; *petalis* albis carnosulis ±7 mm. longis, orbiculari-ovatis obtusis haud unguiculatis; *staminibus* numerosis; *ovario* biloculari.

Mont Mou; stream edge in damp gulley; 600 ft.; cretaceous. 554. Tree; flowers fleshy white on main trunk of tree.

A tree with oblong or oblong-lanceolate leaves and shortly pedicelled flowers from the trunk. There are four calyx-lobes, and the ovary is bilocular. Allied in character of inflorescence to *E. littoralis* Pancher and *E. Homei* Seem.

EUGENIA STEPHANOPHYLLA Bak. fil., sp. nov. *Arbuscula* ad 20-pedalis ramulis cortice cinereo obtectis; *foliis* oblongis vel oblongo-ellipticis 40–45 mm. × 15–25 mm., apice obtusis vel subacutis basi in petiolum 2–4 mm. longum attenuatis nervis lateralibus tenuissimis inconspicuis; *floribus* inter mediocres generis fasciculatis e runco ortis fasciculis plurifloris pedicellis 18–22 mm. longis, gracilibus puberulis; *bracteolis* 1–5 mm. longis, sub calyce parvis oblongis calycis tubo brevioribus; *calycis tubo* ±4 mm. longo, extus pubescente infundibuliformi lobis 4 obtusis 2 mm. longis persistentibus; *petalis* albis; *staminibus* numerosis; *ovario* 2-loculari.

Plaine des Lacs; sheltered valley; 1100–2000 ft. 360. Leaves in apical crown often reddish. Flowers on trunk white, fragrant, buds pink.

A small tree, with leaves in an apical crown and fascicles of slender pedicelled flowers from the trunk, allied to *E. Brongniartiana* Guill. (*E. crassifolia* Vieill.), but pedicels longer and not so hairy.

E. (§ Syzygium) BRACHYCALYX Bak. fil., sp. nov. *Arbuscula* ad *Syzygium lateriflorum* Brongn. & Gris accedens, ramulis teretibus cortice cinereo obtectis ramulis novellis glabris cortice brunneo obtectis; *foliis* glabris 9–10 cm. × 5·5–6 cm. superne nitidis orbiculari-ovatis apice acuminatis apice ipso obtusis basi cuneatis in petiolum 4–5 mm. longum attenuatis, nervis lateralibus numerosis tenuissimis, costa subtus conspicua; *floribus* cymosis sat parvis cymis plerumque ex axilla foliorum delapsorum nascentibus ramoso-patentibus multifloris; *calyce* 1 mm. longo, tubo turbinato limbo truncato; *petalis* albis minutis ad anthesin persistentibus orbiculari-ovatis haud unguiculatis, 1·25–1·50 mm. longis et latis.

Mont Canala; streamside woods, Niaouli region; 1000 ft.; schists. 1256. Small tree, flowers white. Inflorescence 6–10 cm. long. Pedicels 1–1·5 mm. long.

Closely allied to *Syzygium lateriflorum* Brongn. & Gris. Differs by the broader leaves and smaller flowers; the petals are minute.

EUGENIA (§ Syzygium) HYDROPHILA Bak. fil., sp. nov. *Frutex* circ. 5-pedalis ramulis atro-brunneo corticatis; *foliis* oblongo-obovatis vel obovatis 3·5–5·0 cm. × 1·5–2·5 cm., costa subtus conspicua, nervis lateralibus tenuibus, apice obtusis basi in petiolum 2–4 mm. longum attenuatis; *floribus* cymosis sat parvis; *cymis* plerumque ex axilla foliorum delapsorum nascentibus multifloris; *calycis tubo* brevi subgloboso 2 mm. longo, apice truncato vel subtruncato; *petalis* 2·5 mm. longis, calyptratim concretis; *staminibus* numerosis filamentis flexuosis antheris brevibus; *fructu* ignoto.

River Dumbéa; flood plain; 414.

A shrub allied to *Syzygium lateriflorum* Brongn. & Gris, with oblong-obovate or cuneate-obovate punctate leaves, and lateral cymes of rather small flowers with a short subglobose calyx-tube and obsolete lobes.

E. (§ Syzygium) IGNAMBIENSIS Bak. fil., sp. nov. *Frutex* vel *arbuscula* ramulis strictis novellis angulatis; *foliis* oblongo-ovatis vel elliptico-obovatis 25–30 mm. × 10–20 mm., apice rotundatis margine revolutis utrinque opacis basi in petiolum 1–2 mm. longum, attenuatis, nervis lateralibus inconspicuis tenuissimis, costa subtus subprominula; *floribus* cymosis cymis brevibus paucifloris; *calycis tubo* turbinato 2 mm. longo, glabro limbo truncato; *petalis* calyptratim concretis; *fructu* axillari breviter pedunculato extus nigrescente 12–14 mm. diam.

Ignambi. 1512. Shrub or small tree. Flowers yellowish, tinged with red outside.

Allied to *Eugenia stricta* Brongn. & Gris in some respects, with elliptical-obovate very shortly petioled leaves and small flowers in few-flowered cymes. Calyx-tube turbinate short, limb truncate.

E. MAGNIFICA Brongn. & Gris. Mont Canala; intermediate woods and coffee plantation; 1500 ft.; schist. 1258. Tree 30 ft. Leaves puckered, dark green, cauliflorous. Petals white fleshy, stamens and anthers white.

E. PUNCTATA Bak. fil., comb. nov. (*Syzygium punctatum* Vieill.) Kuakué; very abundant on dry hillside scrub; 0–1000 ft. 934. Shrub 6 ft. Dull medium green leaves, yellowish-red midrib. Young fruits with remains of calyx and stamens.

E. (§ Syzygium) PATENS Pancher. River Comboui; alluvial serpentine soil. 2149. Shrub 4 ft. Red-brown receptacle. Petals pinkish outside. Stamens white, sweet-scented.

Other specimens are from River Comboui; 2166. Also from Ignambi, 1858, and from Kuakué, 941.

Eugenia ngoyensis Schlechter is very closely allied.

E. (§ Syzygium) ARBOREA Bak. fil., sp. nov. *Arbor* circ. 30-pedalis ramis cortice cinereo obtectis; *foliis* parviusculis viridibus oblongo-obovatis 3–4·5 cm. × 15–22 mm., apice obtusis basi cuneatis marginibus leviter recurvatis, costa subtus conspicua, nervis lateralibus tenuissimis, petiolo 2–4·mm. longo suffultis; *floribus* paniculatis e ramis adultioribus ortis; *calyce* turbinato 20–25 mm. longo deorsum angusto sursum ampliato tubo ovario adhærente et ultra ovarium producto; *petalis* caducis; *filamentis* elongatis albis; *ovario* 2-loculari.

Ignambi; moist forest; 3000 ft. 1842. Leaves small, stiff, medium green, margin slightly recurved, young twigs yellowish. Flowers on old wood in groups of small panicles. Receptacle greenish white, shining, Perianth caducous. Filaments long, white, scentless. Calyx, the lower narrow portion is 18 mm., the upper broader portion 5–7 mm.

This is a tree 30 ft. high, with panicles of flowers from the older wood. The calyx is 20–25 mm. long. The leaves resemble those of *Syzygium Pancheri* Brongn. & Gris.

EUGENIA PANCHERI Brongn. & Gris. Kuakué; in forest by saw-mill close to the river; 898. Tree 25 ft., also flowers when a small shrub of 4 ft. Leaves medium green, stiff. Flowers white, quickly fading, sweet-scented, honeyed.

E. PTEROCALYX Bak. fil. (*Syzygium pterocalyx* Brongn. & Gris.) Kuakué; uncommon by stream in lowland scrub-area; 500 ft. 937. Small tree, 15 ft.

E. MULTIPETALA Bak. fil. (*Syzygium multipetalum* Brongn. & Gris.) Baie Ngo; 253. Medium-sized stout tree, 20 ft.; occasional along stream-side; 200 ft.; serpentine. Rim of receptacle deep red, stamens white, three perianth segments, and an operculum in bud. Kuakué; small tree 25 ft.; 927. Flood plain, also along river-banks. Light green leaves, with yellowish veins. Flowers white with crimson edge to receptacle. River Ngoyé; 1016. Abundant along edge of river; 0–500 ft. Tree 30 ft. Dark hard foliage. Stiff corymb of flowers with red stamens, honeyed. Scentless.

E. GRISII Bak. fil. [comb. nov.]. (*Syzygium nitidum* Brongn. & Gris.) River Dumbéa; frequent along river-banks; 816. Tree 20 ft., white flowers in corymbs, honeyed.

E. JAMBOS L. Tonine; forest; 1000 ft. 1953. Tree. Receptacle green, petals and filaments scarlet. Widely distributed.

CLAVIS SPECIERUM SECT. CUPHEANTHI.

A. Folia ampla, elongata, petiolata, flores in vetere ligno subumbellati 2–4.
E. austrocaledonica Bak. fil.
(*Cupheanthus austrocaledonicus* Seem.).

B. Folia ampla, oblonga, petiolata. Flores in vetere ligno pauci. Receptaculum rubrum, carnosum, 45–55 mm. longum.
E. Comptonii Bak. fil.

C. Folia ampla, oblongo-obovata, brevissime petiolata. Receptaculum 25–30 mm. longum. *E. paniensis* Bak. fil.

D. Folia ampla, oblongo-oblanceolata, brevissime petiolata. Receptaculum 55–60 mm. longum. *E. neocaledonica* Bak. fil.

E. Folia ampla, oblanceolata, vel oblongo-oblanceolata, sessilia. Receptaculum 40–45 mm. longum. *E. toninensis* Bak. fil.

EUGENIA (§ Cupheanthus) COMPTONII Bak. fil., sp. nov. *Arbor* parva circ. 20-pedalis trunco erecto; *foliis* majusculis oblongis 16–18 cm. × 6–7 cm., costa superne impressa subtus conspicua, nervis lateralibus tenuibus numerosis juxta marginem nervo intramarginali conjungentibus apice obtusis basi lato cuneatis margine undulatis, petiolo 3–4 cm. longo præditis; *floribus* magnis in cymas paucifloras dispositis cymis e trunco ortis; *calyce* turbinato carnoso rubro elongato 45–55 mm. longo, ultra ovarium longissime producto limbo levissime lobato; *petalis* 3 caducis; *staminibus* pallide flavis; *ovario* infero.

Ignambi; forest; 3000 ft. 1710. Small tree, erect trunk, 20 ft. Leaves large, simple, dark green, shining, stiff. Flowers on main trunk, not at base. Receptacle red, fleshy. Stamens bent inwards and downwards in bud. Filaments pale yellow, brown anthers. Petiole bearing a gland about the middle. A small tree with rather large oblong petiolate leaves, and flowers in few-flowered cymes arising from the main trunk.

E. (§ Cupheanthus) NEOCALEDONICA Bak. fil., sp. nov. *Arbuscula* circ. 25-pedalis cortice brunneo et papyraceo obtectis; *foliis* majusculis elongatis 4 dm. × 14–15 cm. oblongo-oblanceolatis, nervis lateralibus subtus conspicuis numerosis circ. 23–26 marginem versus arcuatis et inter se conjungentibus, petiolo brevi præditis; *floribus* caulifloris pedunculis strictis 6–7 cm. longis teretibus glabris 2–3-floris basin versus caulium ortis; *calycis tubo* subcylindrico 55–60 mm. longo 10–15 mm. lato, basi attenuato extus glabro supra ovarium longe producto limbi segmentis 3 brevibus; *petalis* 3 albis caducis 11–13 mm. × 12–15 mm. suborbicularibus; *staminibus* numerosis ore calycis insertis liberis filamentis filiformibus; *ovario* infero 2-loculari, stylo elongato.

Cap Bocage; moist forest; serpentine; sea-level. 1369. Stem usually simple. Bark light brown papery. Crown of thin leaves hard texture. Flowers numerous arising at base of trunk, among humus, 2–3 on peduncle, fleshy, pinkish-white receptacle. Petals white, caducous, usually eaten by snails.

E. (§ Cupheanthus) TONINENSIS Bak. fil., sp. nov. *Arbor* circ. 30-pedalis; *foliis* majusculis ±47 cm. × 15 cm. oblanceolatis vel oblongo-oblanceolatis sessilibus ad summitatem ramorum verticillatis, subtus nervis lateralibus utrinque circ. 23 conspicuis nervo intermarginali conjungentibus costa crassiuscula; *floribus* e trunco ortis pedunculis axillaribus 3-floris; *calycis tubo* subcylindrico 4–4·5 cm. longo, infundibuliformi coriaceo basi attenuato supra ovarium longe producto limbi segmentis sæpissime 3 apice rotundatis ±5 mm. longis; *petalis* albis caducissimis; *staminibus* numerosis ore calycis insertis liberis filamentis filiformibus antheris oblongis loculis parallelis; *ovario* infero 2-loculari, stylo elongato, stigmate capitato; *fructu* ignoto.

Tonine; 1943. Stem erect, rough bark. Flowers on main trunk especially at base. Thick cream-coloured receptacle. Petals white, caducous. Filaments white, scentless.

Closely allied to *E. neocaledonica* Bak. fil.

EUGENIA (§ Cupheanthus) PANIENSIS Bak. fil., sp. nov. *Arbor* alta; *foliis* amplis coriaceis oblongo-obovatis 23–23 cm. × 12–13·5 cm. apice leviter emarginatis, costa subtus conspicua, supra impressa, nervis lateralibus numerosis juxta marginem inter se conjungentibus, petiolo 6–10 mm. longo suffultis; *floribus* cymosis e trunco vel e ramis adultioribus ortis; *cymis* 4–8-floris; *calyce* turbinato mediocri 25–30 mm. longo supra ovarium producto limbo undulato vix partito pedunculis pedicellisque glabris; *petalis* mox delapsis; *staminibus* numerosis albis exsertis; *ovario* 2-loculari, stylo erecto.

Mt. Panié; forest; 1200 ft. 1767. Flowers in cymes on main trunk and old branches. Receptacle white-red towards the top. Perianth forms a conical plug. Stamens infolded in bud. Scentless. Calyx 8–10 mm. broad near the apex. This species is a large tree with large leathery oblong-obovate leaves, and 4–8-flowered cymes. The calyx is 25–30 mm. long.

PSIDIUM KUAKUENSE Bak. fil., sp. nov. *Frutex* 8-pedalis ramis teretibus glabris; *foliis* orbicularibus ovatis 3–7·5 cm. longis 1·5–6 cm. latis, sessilibus vel subsessilibus chartaceis apice obtusis basi rotundatis vel subcordatis, nervis lateralibus tenuissimis, costa subtus conspicua; *floribus* inter mediocres generis in cymis axillaribus et terminalibus cymis paucifloris foliis longioribus pedicellis striatis floribus longioribus; *calycis* tubo glabro 3 mm. long., turbinato lobis 5 persistentibus obtusis 1·5–2·0 mm. longis; *staminibus* numerosis; *ovario* 2-loculari.

Kuakué; overhanging rocky stream in forest, serpentine; 50 ft. 930. Flowers white, petals fleshy, sweet-scented. Petals 6 mm. long.

Allied to *Psidium floribundum* Vieill., but receptacle is shorter, and leaves are sessile or nearly so. A shrub with orbicular-ovate leaves, and flowers in axillary and terminal few-flowered cymes. The calyx is glabrous and campanulate, the lobes persistent.

CARYOPHYLLUS ELEGANS Brongn. & Gris. Mont Panié; among stones by river; 1500 ft. 1764. Small much-branched shrub, 3 ft. Fruits fleshy, scarlet.

Barringtonia neocaledonica Vieill. River Tchiem; abundant in courses of rivers and creeks; 0–500 ft. 2001. Tree 25 ft. Branches thick, but soft. Leaves and flowers on different branches. Leaves in terminal rosettes. Corolla pinkish in bud, white when open. Filaments white. Agrees with Vieillard 2630.

MELASTOMACEÆ.

Melastoma denticulatum Labill. Mont Mou; moister parts of Niaouli region; 800 ft.; cretaceous. 526. Shrub 6 ft. Mont Canala; frequent by streams in Niaouli region and in old cultivated areas; 2000 ft. 1246. Shrub 6 ft. Corolla white. Ignambi; 1841. Samoa, Fiji, Friendly Islands, etc.

LYTHRACEÆ.

Pemphis acidula Forst. Cap N'dona; on rocky places on littoral; 874. Shrub 6 ft. Hard leaves, white flowers, easily falling. Widely distributed.

SAMYDACEÆ.

Casearia Melistaurum Spreng. Ouen Toro, near Nouméa; littoral zone just within forest. 55. Stiff branched shrub, perianth greenish. Tchiem; creekside association. 2004. River Comboui; *Callitris* forest; 200 ft.; serpentine. 2156. Small shrub 3 ft. Branches spreading, dorsiventral. Leaves dark green, hard texture. Flowers white, scentless. Also from Poume; 2377. A plant from River Ngoyé 1011 is closely allied.

Dr. Schlechter seems to have overlooked the above species when he described his *C. silvana* in Engl. Bot. Jahrb. xxxix. 198, as he states: "Die hier beschriebene ist die erste Art welche von der Insel geworden ist." *C. silvana* Schlechter is probably not distinct from *C. Melistaurum* Spreng.

C. Comptonii Bak. fil., sp. nov. *Frutex* circ. 2-pedalis ramulis teretibus lenticellosis; *foliis* oblongis vel oblongo-ovatis 8–10 cm. × 30–35 mm., apice obtusis basi rotundatis margine grosse serratis superne nitidis, costa subtus prominula, utrinque glabris nervis lateralibus utrinque 5–8 gracilibus, petiolo 6–10 mm. longo suffultis; *floribus* viridibus in axillis foliorum glomerulatis, glomerulis petiolis 2–3-plo brevioribus; *pedicellis* brevissimis basi bracteatis; *calycis* 3 mm. longo; *tubo* brevi lobis 5 ovatis; *staminibus* 10 cum staminodiis totidem hirsutis alternatis; *ovario* hirsuto in stylum subnullum attenuato, stigmate capitato; *fructu* ignoto.

Taom; *Casuarina* woods; 200 ft.; serpentine. 2290. Shrub 2 ft.; simple stem, dorsiventral flowering shoots. Flowers green. Leaves glabrous, shining above.

Allied to *C. Melistaurum* Spreng., but differs by the smaller, grossly serrate leaves.

Homalium Guillanii Guillaumin. Kuakué ; forest on alluvium ; 50 ft. 895. Small tree 20 ft. Flowers white, in half-pendent racemes. Faint unpleasant smell.

H. austrocaledonicum Seem. River Comboui ; alluvial serpentine scrub near river ; 100 ft. 2234. Small tree 12 ft. Catkins drooping. Flowers greenish white, slight sweet scent.

H. rubiginosum Warb. (*Blackwellia rubiginosa* Vieill.) Mont Canala ; moist forest ; 1500 ft. ; mica schists. 1267. Small tree 20 ft. with spreading crown. Flowers greenish white. Racemes pendent.

H. sylvicolum Bak. fil., sp. nov. *Arbuscula* circ. 27-pedalis sec. cl. detectorem ad *H. intermedium* Vieill. valde accedens; *foliis* subcoriaceis glabris ovato-lanceolatis 7–9·5 cm. × 3–4·5 cm., margine grosse serratis vel undulatis superne nitidis nervis lateralibus 6–8 marginem versus arcuatis et inter se conjungentibus nervis secundariis tenuibus reticulatis, petiolis 8–11 mm. longis suffultis; *floribus* subsessilibus in racemos spiciformes dispositis; *calyce* 5 mm. longo, tubo extus pubescente longitudinaliter striatis lobis 7 lineari-lanceolatis 2·5 mm. longis, apice subacuminatis petalis æquilongis ; *petalis* 2·5 mm. longis, intus hirtis apice subobtusis ; *staminibus* circ. 28 ; *stylis* 3 ; *ovario* hirto.

Nekando; *Spermolepis* forest ; 1000 ft. ; serpentine. 948. Small tree 20 ft. The distinguishing features of this species are the subcoriaceous ± ovate-lanceolate glabrous petiolate leaves. The flowers are in lax spikes, and there are 7 calyx-lobes alternating with 7 petals, and about 28 stamens and 3 styles. 788 from Mt. Koghi is allied, but the flowers are only in bud.

H. kanalense Briquet. Plaine des Lacs ; flood plain ; 800 ft. ; serpentine. 378. Shrub 6 ft. Flowers greenish.

ONAGRACEÆ.

Jussieua suffruticosa L. Canala ; freshwater swamps and streams ; 1309. Subshrub. Leaves light green, often turning red. Corolla yellow, falling readily. Erect white soft aquatic aerating roots. Ignambi ; freshwater ditches, pools, and muddy creeks ; 1606. Widely distributed.

PASSIFLOREÆ.

Passiflora fœtida L. Port Ngea, Nouméa ; littoral also roadside weed, uncommon ; 24. Calyx with long sticky glandular hairs. Petals white, incurved, Plant nauseous. Widely distributed.

CUCURBITACEÆ.

Bryonopsis laciniosa Naud. Paompai; forest margin and creekside woods; 50 ft. 1908. Tendril climber, herbaceous perennial. Monœcious. Corolla creamy yellow. Fruit oval, acute, glaucous between ridges. Widely distributed.

FICOIDEÆ.

Mollugo nudicaulis Lam. Mont Canala; denuded Niaouli area; 2000 ft.; schist. 1251. Small herb with basal rosette. Widely distributed..

Sesuvium Portulacastrum Lam. Anse Vata; sea-sand. 84. Creeping succulent. Perianth green outside, white within. Widely distributed.

UMBELLIFERÆ.

Hydrocotyle asiatica L. Ignambi; abundant in moister parts of Niaouli association; 3000 ft. 1714. Widely distributed.

Didiscus austrocaledonicus Brongn. & Gris. Île Porc Épic; littoral zone on loose coral sand, plentiful. 922. Herbaceous leaves slightly thickened, light green. Flowers white. Fruit flattened.

Apium Ammi Urban. Nouméa; wet roadside ditches. 39. Flowers white. Widely distributed.

Apium australe Thouars. Isle of Pines; coral sand. Perennial herb. Widely distributed.

ARALIACEÆ.

Myodocarpus crassifolius Dub. & Vig. Mont Koghi; forest, 3000 ft.; serpentine. 726. Tree 25 ft. Branching false dichotomous inflorescences terminal. Leaves tough, hard midrib yellow. Also in scrub as a bush of 4 ft.

M. fraxinifolius Brongn. & Gris. Plaine des Lacs; common, especially on slight slopes; 800 ft.; serpentine. 305. Shrub; simple stem, sometimes branched at top. Winged whitish fruits. Protandrous stamens, very fugacious. Mt. Koghi; forest near summit; 3000 ft. 724. Tree 15 ft. Erect stem, terminal inflorescence.

M. Vieillardii Brongn. & Gris. Plaine des Lacs; abundant on slightly elevated parts of flood plain and on edges of pools; 800 ft.; serpentine. 344. Small shrub reaching 1 ft. without inflorescence. Flowers green. Comboui Mts.; scrubby coniferous forest; 3500 ft.; serpentine. 2182. Small tree 15 ft. Leaves dark green, shining above, stiff. Corolla reddish brown, caducous; anthers pale yellow. Scented, MYODOCARPUS ELEGANS Dub. & Vig. Nekando; coniferous forest; 3000 ft.; serpentine. 1083. Small tree 15 ft.

DELARBREA COLLINA Vieill. Mont Mou; moist valley of Niaouli zone; 800 ft.; cretaceous. 514. Tree 25 ft., false dichotomous branches. Long yellowish inflorescences (spec. of distal $\frac{1}{3}$).

MERYTA CORIACEA Baill. Mont Humboldt; streamside forest; 1500 ft.; serpentine. 1037. Tree 25 ft.; erect, simple stem, crown of leaves some 4 ft. long. Inflorescence in terminal group. Inflorescence white, buds green.

M. MICROCARPA Baill. Ignambi; frequent in forest; 2500 ft. 1611. Small tree 12 ft.; simple stem, crown of leaves. Terminal panicles. Yellow scentless flowers.

From Ouen Toro 56 is another species of *Meryta*, but is without flowers.

SCHEFFLERA COMBOUIENSIS Bak. fil., sp. nov. *Arbuscula* circ. 20-pedalis ad *S. pachyphyllam* Harms accedens; *foliis* longiuscule (7–13 cm.) petiolatis digitatis 3-foliolatis glabris foliolis breviter obovatis vel oblongo-obovatis 8–11 cm. × 3–5 cm., lamina sensim fere ad apicem petioli decurrente apice rotundatis, costa subtus prominente; *panicula* breviter pedunculata terminali ramosa ramulis umbellatim digestis pedicellis crassiusculis; *calycis* margine minute denticulato; *petalis* 5 valvatis crassiusculis; *ovario* 4-loculari stylis 3–4 arcte connatis in flore approximatis erectis in fructu recurvatis.

Comboui Mts.; forest; >3000 ft.; serpentine. 2181. Stems soft, mucilage exudes. Perianth of 5 segments, reflexed with upturned tip. Anthers yellow. Ripe fruits 12–13 mm. long, 7–8 mm. broad.

Allied to *Schefflera pachyphylla* Harms, but the leaflets are larger and the styles fewer. A small tree with digitately 3-foliolate leaves and flowers in terminal umbellate panicles, allied also to *S. Balansæna* Baill. and *S. Le Rati* R. Vig.

S. COMPTONII Bak. fil., sp. nov. *Arbuscula* circ. 20-pedalis late ramosa; *foliis* alternis palmatim 13–14 foliolatis foliolis oblongis vel oblongo-lanceolatis 10–16 cm. × 25–43 mm. papyraceis, apice rotundatis vel emarginatis 15–30 mm. longa petiolulatis, nervis lateralibus tenuibus marginem versus furcatis costa subtus conspicua, petiolo communi ±29 cm. longo foliolis longiori; *inflorescentia* elongata ±41 cm. longa racemosa, ramis patentibus 6–7 cm. longis numerosis tenuibus, floribus minutis numerosis subsessilibus subviridibus; *calycis dentibus* brevissimis acutis; *petalis* triangularibus acutis; *staminibus* 5 petalis alternantibus; *ovario* infero 4-loculari ovulis solitariis pro loculo, stylis minutis.

Ignambi; forest; 1500–3500 ft.; gneiss, frequent. 1669. Soft wood. Leaves alternate. Long racemes of stiff spikes. Flowers greenish, segments reflexed.

The following clavis distinguishes this plant from its nearest allies in the genus :—

A. Foliola 8, oblonga. *S. Candelabrum* Baill.

B. Foliola 12, lanceolata, coriacea, apice acuta, petiolulis subnullis. *S. Vieillardii* Baill.

C. Foliola 13–14, oblonga vel oblongo-oblanceolata, apice emarginata vel rotundata, petiolulis mediocribus suffulta. *S. Comptonii* Bak. fil.

Dizygotheca polyantha Bak. fil., sp. nov. *Arbuscula* 20-pedalis; *foliis* palmatim circ. 8-foliolatis foliolis oblongis vel oblongo-oblanceolatis 20–25 cm longis 7–8 cm. latis 2–3 cm. longe petiolulatis apice rotundatis papyraceis, nervis lateralibus utrinque circ. 12 tenuibus, costa subtus conspicua, petiolo communi longiusculo 30 cm. longo suffultis ; *inflorescentia* ampla multiflora copiose ramosa umbellis circ. 4–8-floris pedicellis strictis glabris ; *calyce* 1·5 mm. longo dentibus brevissimis tubo subcampanulato ; *petalis* 3 mm. longis flavo-viridibus concavis ; *stylis* connatis ; *staminibus* petalis brevioribus, antheris 4-loculatis ; *ovario* 6–8-loculari ; *fructu* stigmatibus coronato.

Paompai ; forest margin ; 1500 ft. 1896. Inflorescence very large, terminal. Petals yellow-green, reflexed. A tree about 20 ft. in height with palmately foliolate petiolulate leaves, a very ample inflorescence, and 4-celled anthers.

D. parvifolia R. Vig. Pointe Bassalle ; littoral edge of mangrove swamp. 639. Tree 25 ft. Flowers greenish, sweet-smelling, attracting bees.

D. Vieillardii R. Vig. Mont Canala ; frequent in forest, a co-dominant tree ; 1000 ft. 1175. Tree 50 ft. Crown of large palmate leaves. Large terminal umbel. Specimen of one branch of umbel.

Eremopanax canalensis Bak. fil., sp. nov. *Arbor* sec. cl. detectorem 25-pedalis ; *foliis* pinnatis multifoliolatis foliolis petiolulatis chartaceis præter costam fere glabris oblongis 11–15 cm. × 4–5·5 cm., apice acutis vel subacutis basi late cuneatis, nervis lateralibus tenuibus marginem versus arcuatis et inter se conjungentibus petiolulis 15–30 mm. longis ; *umbellulis* 3–12-floris in axillis foliorum simplicium dispositis ; *calycis limbo* infundibuliformi dentibus brevibus ; *petalis* triangularibus 3·5 mm. longis ; *staminibus* 5 disco crasso in medio conico elevato ; *ovario* uniloculari, ovulo solitario ex apice pendulo.

Mont Canala ; forest ; 1000 ft. ; frequent. 1119. Large pinnate leaves, brown receptacle. Rachis of leaf 70–80 cm. long. The calyx is funnel-shaped and covered with a ferruginous tomentum, the tube is 6 mm. long. The ovary is unilocular with a single pendulous ovule.

No. 1126 from Mont Canala is closely allied. The fruits are 15 mm. long, 10 mm. broad.

OCTOTHECA PLERANDROIDES R. Vig. Mont Koghi; frequent in forest margin; 2000 ft.; serpentine. 789. Tree 30 ft. Flowers greenish white.

The following is closely allied: Mont Panié Forest; 1500 ft. 1787. Tree 20 ft. Buds black shining. Perianth green on inside, reflexed.

TIEGHEMOPANAX AUSTROCALEDONICUM R. Vig. Mont Mou; frequent in forest; 1500 ft.; serpentine. 433. Tree 12 ft.; simple stem, crown of leaves. Terminal inflorescence.

T. DIOICUS R. Vig. (*Polyscias dioica* Harms.) Mont Koghi; forest-margin; 2000 ft.; serpentine. 785. Small tree 20 ft. Fruit a small dark berry. Kuakué; edge of scrubby forest; 100 ft.; serpentine. 950. Shrub or small tree. Fruit a reddish, slightly flattened berry.

T. SUBINCISUS R. Vig. Couline Neketé; forest; 1000 ft.; schists. 1278. Small tree. Leaves dark green, rachis and veins brown. Inflorescence axillary, flowers white.

ENOCHORIA Bak. fil., gen. nov.

Flores polygami. Flos ♀. *Calycis tubus* ovario adnatus limbus in lobos 6–8 divisus, lobis triangularibus acutis crassis ovario longioribus glabris. *Petala* 0. *Ovarium* 6–8-loculare e carpellis 6–8 sistens, carpello quoque stylo crasso et brevi coronato, stigmate lineari in facie interiore decurrente, stylis nec in umbonem vel conum brevem connatis. *Ovula* in loculis solitaria, ab apice pendula; fructus ignotus. Flos ☿. *Stamina* 6–8, antheræ filamentis longiores, longitudinaliter dehiscentes. *Arbor* erecta. *Folia* digitatim composita, petiolata, foliolis ±7 majusculis penninerviis glabris petiolulatis apice acutis basi cuneatis membranaceis, nervis lateralibus tenuibus creberrimis parallelis ab costa angulo recto vel fere recto abeuntibus margine undulatis vel crenulato-undulatis. *Florum capitula* secus ramos paniculæ sessilia, multiflora vel pluriflora, densa, bracteata, floribus singulis basi bracteatis. (Pl. **19**.)

Tree; erect stem. Crown of large digitate leaves thin, medium green. Terminal fleshy inflorescence, flowers dull yellowish.

It is allied to *Brassaia actinophylla* from Queensland in which the flower-heads are rather numerous along the stout rachis of the racemes and not as in *Enochoria* sessile; and in *Enochoria* there are no petals or they are at an early period caducous. The leaves are somewhat similar to those of *Schefflera affinis* Baill. The genera *Strobilopanax* and *Botryodendron* have flowers in heads, but simple leaves.

ENOCHORIA SYLVICOLA, sp. nov. *Arbor* erecta; *foliis* palmatim compositis petiolatis foliolis ±7 majusculis membranaceis oblongis vel oblongo-ellipticis

25–30 cm. × 8–10 cm., nervis lateralibus creberrimis ab costa angulo fere recto abeuntibus tenuibus parallelis marginem petentibus glabris subtus pallidioribus apice acutis basi cuneatis petiolulis 5–7 cm. longis; *florum capitulis* 8–12 mm. longis secus ramos paniculæ sessilibus densifloris bracteatis inflorescentia carnosula terminali sec. cl. detectorem; *floribus* polygamis in specimine hermaphroditis et femineis; *calyce* 4 mm. longo lobis 6–8 acutis 1·5 mm. longis; *ovario* 6–8-loculari stylis crassiusculis brevibus erectis vel suberectis ovulis in quoque loculo solitariis ab apice pendulis.

Canala; moist forests, schists; 1336. In flower June. Crown of large digitate leaves which are thin medium green. Terminal fleshy inflorescence. Flowers dull yellowish.

Apiopetalum arboreum Bak. fil., sp. nov. *Arbor* sec. cl. detectorem 30-pedalis; *foliis* obovatis vel elliptico-obovatis 25–30 cm. × 12–14 cm. subcoriaceis glabrescentibus margine insigniter et patenter serratis basi in petiolum 5–6 cm. longum attenuatis apice breviter acuminatis; *floribus* in umbellas compositas digestis umbellulis multifloris; *bracteis* 10–16 mm. longis angustis; *pedicellis* hirtis; *calycis lobis* 0·5 mm. longis triangularibus; *petalis* delapsis; *disco* conico crassiusculo; *ovario* 2-loculari extus hirto stylis brevibus connatis; *fructu* immaturo subduplo longiori quam lato.

Mont Mou; frequent on edge of summit forest; 3500 ft., serpentine. 633.

This differs from *A. velutinum* Baill. in being a tree 30 ft. high and having much broader leaves which are glabrescent.

Polyscias botryophora Harms. Mts. to north of R. Ngoyé; lowland serpentine scrub and forest margin; 1000 ft. 2062 *a*. Small tree ≤12 ft. Crown of thick leaves. Inflorescence terminal, dark brown. ☿. Also same locality; 2062. Small tree < 12 ft. ♂. Taom; riverside pebbles; serpentine; 2321. Small tree.

P. Schlechteri Harms. River Comboui; among rocks in river-bed; 500 ft., serpentine. 2198. Small tree. Inflorescence terminal. Petals deep red-brown, recurved. Anthers buff. Sweet-scented.

GAMOPETALÆ.

By Spencer Le M. Moore.

RUBIACEÆ.

Bikkia fritillarioides Schlechter. Nekando; serpentine scrub; 2000 ft. 2118. Shrub 4 ft. Flowers pendent, scentless. Corolla scarlet, slightly darker at base.

BIKKIA FULGIDA S. Moore, sp. nov. *Frutex* elatus fere trimetralis; *ramulis* validis glabris cortice purpureo-brunneo nitido obductis; *foliis* obovato-oblanceolatis basi in petiolum crassum gradatim extenuatis apice rotundatis coriaceis utrobique glabris costa media subtus optime eminente costis lateralibus paucis nequaquam conspicuis usque 17 cm. long., pet. 2 cm.; *stipulis* latis truncato-rotundatis 4 mm. long.; *floribus* in cymas extra-axillares plurifloras foliis breviores dispositis pedunculo usque 2·5 cm. long. pedicellis 2–3-nis 12–15 mm. long. fultis; *ovario* infundibuliformi quam pedicellus breviore; *calycis* segmentis oblongis vel obtusiusculis carnosulis glabris 4–6 mm. long; *corolla* majuscula 5-mera dependente tubo campanulato-infundibulari intus prope basin piloso fere 5·5 cm. long. lobis late triangularibus obtusis 8 mm. long.; *filamentis* ima basi villosulis alibi glabris compressis 33 mm. long. antheris anguste linearibus inclusis 12–14 mm. long.; *stylo* corollæ tubo æquilongo glabro; *stigmate* clavellato.

Baie Kuakué; abundant in serpentine scrub; 300–1000 ft. 886.

Can be told from *B. fritillarioides* Schlechter by the larger leaves, the pedunculate several-flowered inflorescences, narrower calyx-lobes and differently shaped corolla.

B. CAMPANULATA Schlechter. River Dumbéa; woods on steep slopes above stream; 200 ft.; serpentine. 814. Taom; serpentine scrub; 1000 ft. 2302. Poume; occasional in serpentine scrub; 1000 ft. 2383. Small shrub 2 ft. to tree of 25 ft. Flowers pendent, scarlet, scentless.

B. ALYXIOIDES S. Moore, sp. nov. *Frutex* fere bimetralis; *ramulis* validis 5 mm. diam. cinereis glabris foliorum mortuorum cicatricibus arcte approximatis signatis; *foliis* parvis 2·5–3·5 raro 4 cm. long. 8–10 mm. lat. anguste obovato-oblongis obtusissimis basi in petiolum brevem crassum angustatis margine cartilagineis revolutisque coriaceis utrinque glabris costis lateralibus obscurissimis; *stipulis* abbreviatis late triangularibus acutis; *floribus* in axillis superioribus solitariis vel perpaucis cymam valde abbreviatam efficientibus; *pedicellis* puberulis 5 mm. long. ovario oblongo-turbinato circiter æquilongis; *calycis* segmentis bilateraliter compressis linearibus obtusis latere interno ciliolatis 5·5–6 mm. long.; *corolla* 5-mera pendente campanulata intus basin versus pilosa ceteroquin glabra fere 5 cm. long. lobis triangularibus acutis 8·5 mm. long.; *filamentis* corollæ tubo plane brevioribus 30 mm. long. inferne pilosis antheris angustissime linearibus inclusis 11 mm. long.; *stigmate* clavellato incluso 2 mm. long.

Comboui Mts.; serpentine scrub; 2500 ft. 2188.

To be referred here is 2019 from Nekando Forest, 3500–4000 ft, a small tree 25 ft. high with often broader and sometimes retuse leaves (up to 22 mm. in breadth) and cream-yellow corollas mottled with scarlet, of which the tube is a little shorter (4·5 cm. long). Distinguished from *B. campanulata*

Schlechter *inter alia* by the foliage, the smaller calyx and the straight (not twisted) anthers.

BIKKIA PARVIFLORA Schlechter & K. Krause (ex descript.). Nekando; *Spermolepis* forest; 1000 ft. 981. Uncommon shrub or small tree. Flowers white, pendulous, scentless.

B. ARTENSIS Guillaum. River Dumbéa; on steep slopes above river; 299 ft.; serpentine. 813. Pic La; serpentine scrub; 1000 ft. 859.

B. TRUNCATA S. Moore, sp. nov. *Frutex* fere bimetralis; *ramulis* fusco-brunneis glabris sat distanter cicatriciferis; *foliis* petiolatis oblongo-oblanceolatis apice sæpissime breviter cuspidato-attenuatis ipso obtusis basi gradatim extenuatis coriaceis glabris 6–8 × 2·5–3 cm. (pet. 1 cm. long.) costis lateralibus paucis parum aspectabilibus; *stipulis* abbreviatis truncatis; *cymis* extra-axillaribus abbreviatis paucifloris pedunculo 5 mm. long. floribus solitatim vel binatim oriundis pedicello 5 mm. long.; *ovario* turbinato 3 mm. long.; *calycis* segmentis ovario circiter æquilongis subæqualibus compressis subulatis dorso carinatis; *corolla* 4-mera tubuloso-campanulata ore truncato-undulata inferne transversim rugosa intus prope basin pubescente 3·5 cm. long.; *filamentis* vix 30 mm. long. deorsum compressis pubescentibusque antheris inclusis anguste linearibus tortis 5·5 mm. long.; *stylo* incluso 31 mm. long. stigmate satis tenui bifido coronato.

Cap Bocage; occasional in serpentine scrub; 800 ft. 1391.

The smallish truncate corollas afford an easy means of recognising the species. To this belongs 1108 from Baie Mackan, Canala, serpentine scrub, 80 ft. Besides flowers these bear turbinate, sulcate, glabrous, shining fruits 7–8 × 4–5 mm.

B. COMPTONII S. Moore, sp. nov. *Frutex* circiter bimetralis; *ramulis* validis quadrangularibus brunneis subdistanter cicatriciferis; *foliis* breviter petiolatis late obovatis apice rotundatis nonnunquam retusis basi cuneatis tenuiter coriaceis glabris pag. utraque costa media uti costæ laterales perspicua 10–11·5 × 6·5–7 cm. (pet. 12–15 mm. long.); *stipulis* a basi lata triangularibus acuminatis 6 mm. long.; *floribus* axillaribus solitariis pedicellis ovario paullulum breviore fultis; *ovario* 16 mm. long. cylindrico-turbinato quadrangulari glabro; *calycis* limbo 4 mm. long. glabro satis bene evoluto lobos subulatos vix semiæquante; *corolla* inferne cylindrica transversimque rugosa circiter a medio campanulatim amplificata 6·5 cm. long. lobis 4 latissime triangularibus apice brevissime cuspidulatis ægre 1 cm. long; *filamentis* usque medium pubescentibus 4 cm. long. antheris inclusis anguste oblongis obtusis rectis 2·3 cm. long.; *stylo* incluso apicem versus piloso 5 cm. long.; *stigmate* incurvo vix ampliato.

Isle of Pines; sub-littoral zone. 2259.

This is much like *B. mariannensis* Brongn., which has narrower and thinner leaves, differently shaped calyx segments, a still longer corolla and an elongated, clavate stigma.

LINDENIA VITIENSIS Seem. River Tchiem; creekside; 200 ft. 1978. Western Polynesia.

LUCINÆA NEOCALEDONICA S. Moore, sp. nov. *Frutex* scandens, sursum foliosus aliquanto viscidus; *ramulis* subteretibus striatulis minute puberulis; *foliis* vulgo 3·5–4 × 1·8 cm. breviter petiolatis ellipticis vel anguste oblongo-obovatis utrinque obtusis crassiusculo-coriaceis microscopice puberulis pag. sup. nitidis costis lateralibus paucis inconspicuis; *stipulis* petiolos longit. superantibus (5–9 mm. long.) connatis apice rotundatis; *capitulis* adusque 18 (sæpe vero paucius) -floris 7–8 mm. diam.; *ovario* 1 mm. long. breviter cylindraceo succo resinoso implicato; *calyce* cupulari ovarium adæquante; *corollæ* 5 mm. long. tubo ex calyce eminente a medio leviter ampliato extus puberulo intus in faucibus villoso lobis tubum æquantibus ovato-oblongis apice incrassatis recurvis quoque basi pilorum pulvino prædito; *antheris* semi-exsertis subsessilibus faucibus insertis oblongis acutis 1·5 mm. long.

No note of locality. 2304. The corollas examined were pierced by some insect, and the styles of such flowers could not be found.

No. 2368 from Poume, serpentine scrub, 500 ft., with somewhat smaller and relatively broader leaves, is to be referred here.

This Malayan genus has recently been reported from New Guinea (Valeton in Nova Guinea, Bot. viii. 462; Wernham in Trans. Linn. Soc., Bot. ser. 2, ix. 71), and its further extension to New Caledonia is a fact of some interest.

TARENNA LEIOLOBA S. Moore, comb. nov. (*Chomelia leioloba* Guillaum. ex descript.) Plaine des Lacs; *Dacrydium-Casuarina* association on dry slopes. 373.

Until quite recently this genus was not known to occur in New Caledonia, although it extends from India through the Archipelago to Australia and Polynesia. Guillaumin (Not. System. iii. 162) records four New Caledonian species.

RANDIA NGOYENSIS Hutchins. ms. in Herb. Kew. (*Gardenia ngoyensis* Schlechter). River Comboui; creekside forest in alluvial plain; 50 ft. 2226. Small tree 20 ft. Corolla white, scentless.

R. COMPTONII S. Moore, sp. nov. *Frutex* glaber, bimetralis; *ramulis* subteretibus subdistanter foliosis; *foliis* (4–11 × 3–5·5 cm.) petiolatis ovatis vel ovato-oblongis obtusis nisi obtusissimis basi cuneatis coriaceis supra nitentibus costa media facie utravis facile aspectabili costis lateralibus utrinque 8–9 tenuibus pet. 1–2·5 cm. long.; *stipulis* ovatis acutis vel breviter acuminatis usque 7 mm. long.; *cymis* 3 × 3 cm. brevibus pedunculatis axillaribus vel terminalibus paucifloris pedunculis 1·5–2·5 cm. long.; *bracteis* ± 3 mm. long. parvis late subulatis pedicellis æquilongis; *ovario* ovoideo glabro 2·5 mm. long.; *calycis* limbo cupulari 2 mm. long. breviter dentato; *corolla* in sicco nigrescenti pro genere parva hexamera hypocraterimorpha tubo late oblongo quam lobi ovato-oblongi obtusi recurvi 5 mm. long. duplo breviore; *staminibus* ore corollæ insertis antheris subsessilibus oblongis obtusis 3 mm. long.; *ovario* 2-loculari; *ovulis* pluribus placentæ brevi affixis; *stylo* exserto 5·5 mm. long.; *stigmate* anguste clavato 2 mm. long.

Callitris forest by River Comboui; 100 ft.; serpentine. 2150.

In foliage most like *R. nigricans* Schlechter among New Caledonian species, but with several differences. It is more like the Australian *R. densiflora* Benth.

GARDENIA MOLLIS Schlechter. Ignambi; forest; 1000 ft.; gneiss. 1646.

The specimen is in fruit (without flowers) and for this reason, fruit being so far unknown, the identification is somewhat doubtful. Moreover Schlechter defines the species as a shrub, whereas Mr. Compton notes his specimen as from a "medium-sized tree," but perhaps Schlechter's material came from a precociously flowering source. The indumentum, a remarkable feature it may be noted in the genus, is identical in both cases. The hirsute fruit, apparently not yet ripe, is ovoid or ovoid-oblong, nearly or quite 2·5 cm. long by 12–13 mm. broad, and provided with a straight beak, 1–1·5 cm. in length, which is crowned by the persistent calyx.

No. 1237 from Mont Canala, moist forest 3000 ft., also in fruit, must be a variety of this if not a distinct and allied species. With broader leaves obtuse at base on petioles of 1–2 cm. and hairy all over the underside instead of on the nerves only, the latter contingency would seem the more probable. The sessile fruits are less hairy than those of the other specimen.

G. CERIFERA S. Moore, sp. nov. *Frutex* vel arbuscula, maxime viscida; *ramulis* saltem superne bene foliosis aliquanto tetragonis; *foliis* amplis 12–17 × 5·5–7·5 cm. petiolatis oblongo-ovatis apice cuspidato-attenuatis ipso obtusis basi obtusis coriaceis pag. utraque nitentibus costis lateralibus utrinque circiter 10 optime perspicuis perpaucis proximalibus interdum oppositis (pet. ± 1 cm. long.); *stipulis* 5 mm. long. cupulatis apice acutis; *floribus* in axillis superioribus solitariis pedunculatis 5-meris pedunculis 10 mm. long.; *ovario* anguste oblongo-ovoideo quam pedunculus paullo longiore; *calycis* lobis conspicuis foliosis 23 mm. long. obovato-spathulatis obtusissimis uti partes juveniles succa resinosa copiose obductis; *corollæ* albæ tubo superne gradatim ampliato calycis lobis æquilongo lobis ovato-oblongis obtusissimis quam tubus paullo longioribus (27 mm. long.); *antheris* inclusis; *stylo* breviter exserto 25 mm. long.; *stigmate* fusiformi apice bifido 5 mm. long.

River Comboui; *Callitris* forest; 200 ft.; serpentine. 2160.

Conspecific with this is Schlechter 1511, distributed and noticed (Engl. Bot. Jahrb. xxxix. 256) as *Gardenia lucens* Panch. & Sebert, a species described as having oblong or lanceolate leaves 6 × 2 cm., sessile flowers, a toothed calyx and fruit the size of a "petite noix." There is no specimen of this in our herbaria, and though apparently allied to, it is manifestly different from Mr. Compton's plant.

To be referred here is :—No. 1012, River Ngoyé, *Casuarina* forest, 500 ft., serpentine ; with smaller leaves (6–10 × 3–5 cm.) and smaller calyx lobes (18 × 10 mm.). This is noted as a shrub or small tree with calyx persistent on the large orange-coloured fruit. The young resinous buds are chewed by the natives to produce a kind of sealing-wax.

GARDENIA SYLVESTRIS S. Moore, sp. nov. *Frutex* nisi *arbuscula* usquebimetralis ramosa novellis puberulis floribusque exemptis glabra; *ramulis* erecto-ascendentibus deorsum nudis vel potius stipulis fuscis persistentibus præditis sursum paria foliorum pauca emittentibus glabris; *foliis* 2·5–5·5 × 1·2–2·2 cm. oblongo-oblanceolatis obtusissimis basi in petiolum brevem (2–3 mm. long.) cuneatim coartatis utrobique succam resinosam copiose efferentibus costa centrali pag. utraque optime eminente costis lateralibns utrinque circa 8 parum visibilibus inferioribus 2 sæpe oppositis suboppositisve; *stipulis* 2–3 mm. long. connatis abbreviatis truncatis diu persistentibus ; *floribus* subsessilibus ex axillis summis solitatim oriundis ; *ovario* turbinato calycis limbo paullo breviore; *calycis* lobis 5–7 mm. long. foliosis lineari-oblongis acutis vel obtusiusculis uti ovarium puberulis necnon valde resinosis ; *corolla* alba suaveolente extus puberula intus juxta medium pilosa tubo subcylindrico (superne leviter gradatimque dilatato) 21 mm. long. lobis obovatis apice rotundatis quam tubus plane brevioribus (13 × 10 mm.) ; *antheris* fauci affixis breviter exsertis apice uncinulatis 13 mm. long.

Port Déspointes ; woods. 225. There is doubt about the style which, in the case of the only flower examined, is perhaps not the entire organ : this measures to the tip of the 2-armed stigma only 5·5 mm. in length.

Evidently near *G. noumeensis* Schlechter & K. Krause, according to the description differing from it in the obtuse leaves, the calyx with lobes only half as long, the tube of the corolla quite or nearly twice as long and lobes much shorter than the tube, instead of equalling it in length or almost so, and finally in the stamens half as long again. As far as the incomplete description goes, it shows much agreement with *G. lucens* Panch. & Sebert, except that the calyx of this is said to be 5-toothed, certainly not a possible account of the foliaceously lobed calyx of *C. sylvestris*.

Conspecific with this are Deplanche 395 and Vieillard 2747 (neither number cited by Guillaumin), named at Kew "*Gardenia Fitzalani* F. Muell." an entirely different plant.

ATRACTOCARPUS CUCUMICARPUS S. Moore, sp. nov. *Arbuscula* ; *foliis* (uno solum viso) magnis breviter petiolatis ovato-oblongis obtusissimis basi late

rotundatis margine undulatis 30×14 cm. pergamaceis utrobique uti inflorescentia glabris costa media crassa maxime perspicua costis lateralibus utrinque 12–13 mediocriter visibilibus proximalibus oppositis vel suboppositis distalibus alternis; *stipulis* ——; *cymis* axillaribus perpaucifloris usque 30 cm. long.; *foliis floralibus* amplis sessilibus basi cordatis apice rotundatis ipso mucronulatis 2–8×1–4 cm.; *ovario* cylindrico longitrorsum costato glabro 3 mm. long.; *calycis* circa usque medium divisi 3 mm. long. lobis ovatis acuminatis margine ciliatis; *corollæ* albæ tubo sursum gradatim leviterque amplificato 21 mm. long. lobis ovato-oblongis acutis tubum adæquantibus; *staminibus* fauci affixis; *antheris* inclusis; *stylo* incluso 13 mm. long.; *stigmatis* ramis lineari-lanceolatis acutis 7 mm. long.; *fructu* (haud viso) "elongato, cucumerino, basi apiceque angustato, 10 unc. longo."

Cap N'dona; littoral zone. 866.

Schlechter (Engler Bot. Jahrb. xl. 43) proposed the genus for a New Caledonian plant differing from *Randia* only in the long hard woody fruits. This plant (*A. bracteatus* Schlechter) he describes as having, compared with the present plant, smaller narrowly oblong shortly acuminate rigidly coriaceous leaves, smaller bracts (floral leaves), dentiform calyx lobes, a longer ovary at time of flowering and a smaller fruit. *Randia Brandzeana* Baill. (Adansonia, xii. 244) would appear to be a congener, and Guillaumin (Not. System. ii. 195) suggests that two species referred by Baillon (in MS. only) to *Genipa* belong to this genus.

Atractocarpus oblongus S. Moore, sp. nov. *Frutex* elatus, fere bimetralis, glaber; *ramulis* validis cortice longitrorsum rimoso griseo-brunneo circumdatis; *foliis* 18–22×4·5–5·5 cm. oblongis obtusis vel obtusissimis basi in petiolum brevem cuneatim attenuatis coriaceis costa media pag. utravis optime aspectabili costis lateralibus utrinque circa 10 alternantibus proximalibus raro oppositis vel suboppositis; *stipulis* elongatis (3 cm. long.) lineari-lanceolatis acutiusculis mox dehiscentibus; *cymis* axillaribus perpaucifloris pedunculis ancipitibus quam folia certe brevioribus insidentibus floribus congestis; *foliis floralibus* approximatis suborbicularibus tenuiter coriaceis 2 cm. long.; *bracteis* 4 mm. long. ovatis obtusis margine ciliatis pedicellum brevem (2 mm. long.) vaginantibus; *ovario* subcylindrico quam calycis limbus longiore 7 mm. long.; *calycis* 3·5 mm. long. limbo tubuloso segmenta late deltoidea acuta margine ciliata excedente; *corollæ* albæ 5-meræ tubo infundibulari a medio gradatim amplificata 22 mm. long. lobis ovato-oblongis obtusissimis tubo vix æquilongis; *staminibus* inclusis antheris lineari-oblongis acutis 5·5 mm. long.; *stylo* 13 mm. long.; *stigmate* fusiformi breviter 2-ramoso apice solummodo exserto.

Plaine des Lacs; Kaori Forest; 600 ft.; serpentine. 395. Although without fruit, there seems no room for doubt concerning the genus to which this very distinct plant belongs.

TIMONIUS NGOYENSIS Schlechter. Nekando; *Spermolepis* forest; 1000 ft.; serpentine. 985. Small diffuse tree. Fruit with 5 carpels and 8 seeds in one row to each carpel: hard, stony endocarp.

T. PLATYCARPUS Montrouz. Baie Uié; serpentine scrub; 50 ft. 856. Nekando, *Spermolepis* forest; 1000 ft.; serpentine. 982. River Ngoyé; among rocks in stream-course; serpentine; 400 ft. 2094. Port Bouquet; lowland riverside serpentine scrub; 50 ft. 2243. Shrub or small tree up to 15 ft. Corolla white speckled with pink, or pink or red with the limb white. The female flowers have a 10-celled ovary, the hermaphrodite a 3-celled.

CYCLOPHYLLUM CYMOSUM S. Moore, sp. nov. *Frutex* glaber vel arbuscula; *ramulis* subteretibus fuscis; *foliis* amplis sessilibus subsessilibusve ovatis basi late rotundatis tenuiter coriaceis costis lateralibus paucis mediocriter conspicuis 12–13·5 × 5–6 cm.; *stipulis* triangularibus acuminatis usque 6·5 mm. long.; *floribus* in cymas breves axillares pedunculatas plurifloras foliis multo breviores (4 × 4 cm.) dispositis; *bracteis* parvis triangularibus acutis quam pedicelli paullo brevioribus; *ovario* 1·5–2 mm. long. turbinato pedicello ægre æquilongo; *calycis* limbo 1 mm. long. dentibus deltoideis acutis; *corollæ* hypocraterimorphæ tubo elongato 15 mm. long. sub limbo leviter ampliato ceterum cylindrico intus glabro lobis 5–6·5 mm. long. ovato-oblongis obtusis; *staminibus* fauci insertis antheris subsessilibus apice ex ori eminente oblongis obtusis 3 mm. long.; *stylo* corollæ vix æquilongo glabro; *stigmate* pyriformi culmine excavato; *ovulo* ex apice ipso loculi pendente.

Ignambi; forest; 1500–2000 ft.; gneiss. 1681.

Being reluctant to describe this very distinct plant as the type of a new genus, it is proposed to place it in *Cyclophyllum* Hook. f., from which it differs in two points, namely the cymose (not solitary) flowers and the corolla with a naked throat, both of them, it must be admitted, characters of importance in Rubiaceæ. Hooker's type species, *C. Deplanchei*, has, as Baillon (Adansonia, xii. 183 *sqq.*) shows, several New Caledonian congeners; but the French botanist regards *Cyclophyllum* as a section merely of *Canthium*, thereby failing to recognise, besides the large corollas, two important differences, the pyriform stigma and the apical (not septal) insertion of the ovules.

MERISMOSTIGMA, *Rubiacearum* e tribu *Vangueriearum* genus novum.

Calycis limbus cupularis, obscure denticulatus. *Corolla* subrotata lobis quam tubus latus longioribus, tubo intus pulvinis 5 lobis oppositis prædito. *Stamina* 5, corollæ ori affixa, filamentis brevibus antheris dorso affixis lineari-oblongis obtusis exsertis. *Discus* elevatus, prominens. *Ovarium* 2-loculare; *stylus* filiformis; *stigma* biramosum. *Ovula* in loculis solitaria, ab apice septi pendula. *Fructus* ——. *Arbuscula* glabra, in sicco fuscescens. *Ramuli* crebro foliosi. *Folia* petiolata, tenuiter coriacea. *Stipulæ* breves, connatæ, diutule persistentes. *Flores* submediocres, pedicellati, in cymas pedunculatas,

umbellatas, bracteatas, plurifloras, axillares et terminales digesti, ita paniculam terminalem referentes.

MERISMOSTIGMA NEOCALEDONICUM S. Moore, sp. unica. (Pl. **20.**) *Ramulis* subteretibus ad nodos tumidis distanter cicatriciferis; *foliis* 7–10×2·5–4 cm. oblongo-oblanceolatis vel oblongo-obovatis obtusis nisi obtusissimis nonnunquam retusis basi cuneatim angustatis pag. utraque pallide nitentibus costis secundariis paucis mediocriter aspectabilibus petiolis 1–1·5 cm. long.; *stipulis* vix 3 mm. long.; *cymis* foliis ultimis imminutis circiter æquilongis (4×3 cm.); *pedunculis* pedicellos longe excedentibus illis 2–3 cm. iis 5 mm. long.; *bracteis* parvulis ovatis obtusis vel acutis; *ovario* fere 3 mm. long. ovoideo-turbinato quam calycis limbus paullulum longiori; *corollæ* albæ tubo ex calyce breviter eminente 4 mm. long. lobis cito reflexis oblongis obtusis crassiusculis 6 mm. long.; *filamentis* glabris 3 mm. antheris 6 mm. long.; *stylo* crassiusculo glabro 4 mm. long.; *stigmatis* ramis anguste linearibus obtusis.

Ignambi; forest; 2000 ft.; gneiss. 1482.

The chief characteristics of the genus are the inflorescence and the biramose stigma, the latter a very unusual feature of the *Vanguerieæ*.

IXORA YAHOUENSIS Schlechter. (*I. neocaledonica* Hochreut.) Mont Canala; forest; 2000 ft.; mica schist. 1115. Shrub 6 ft. Corolla with crimson tube and white spreading limb.

I. CAULIFLORA Montrouz. (ex descript.). River Ngoyé; frequent in *Spermolepis* forest; 350 ft.; serpentine. 1025. Small tree. Flowers from main stem on protruding lumps of callus: tube crimson at base, fading off to white at mouth. Stigmas pink. The specimen agrees well with the description so far as concerns the leaf, but the corollas are a little short. A main feature separating this species from others which are cauliflorous is the acute ending of the leaves.

I. KUAKUENSIS S. Moore, sp. nov. *Arbuscula* 8-metralis, glabra; *trunco* cortice griseo circumdato; *ramulis* compressiusculis saltem sursum foliatis; *foliis* 24×6·5 cm. valide petiolatis (pet. 2·5 cm. long.) oblongo-oblanceolatis obtusissimis basi gradatim angustatis coriaceis pag. sup. nitidis prominenter reticulatis costis lateralibus pluribus (utrinque circa 20) interjectis aliis brevioribus sed pariter prominentibus; *stipulis* triangularibus acutis quam petioli certe brevioribus (8 mm. long.); *cymis* paucifloris in trunco sessilibus; *pedicellis* ovario sæpius longioribus basi vel juxta medium vel apice bracteatis; *ovario* 1·5 mm. long. turbinato calyci tubuloso 4-dentato æquilongo; *corollæ* 4 cm. long. 4-meræ tubo calycem multoties superante quam lobi oblongi acuti 4-plo longiore; *staminibus* ori affixis exsertis filamentis quam antheræ 5 mm. long. brevioribus; *stigmate* primo fusiformi apiceque bifido dein e ramis 2 lineari-lanceolatis sistente.

Kuakué; forest on edge of alluvium; serpentine; 50 ft. 928.

Var. BREVIFLORA. A typo divergens solummodo ob flores breviores circa 2·5 cm. long. Mont Dore; valley forest; 200 ft.; serpentine. 845. Small tree 20 ft. Corolla with pink tube and white limb.

The species is easily distinguished from *I. cauliflora* Montrouz. by the blunt, more lengthily stalked leaves and the markedly pedicelled flowers.

IXORA FLORIDA S. Moore, sp. nov. *Frutex* 2½-metralis, glaber; *ramulis* sat validis cortice cinereo obductis foliorum cicatricibus prominentibus onustis; *foliis* 8–12 × 4·5–5·5 cm. ovato-oblongis ovatisve obtusis vel retusis basi in petiolum latum ±10 mm. long. coartatis crasse coriaceis supra leviter nitidis costis lateralibus utrinque circa 8 parum prominulis reticulo submediocriter visibili; *stipulis* petiolis brevioribus (5 mm. long.) late ovatis acutis; *cymis* terminalibus paniculatis foliis circiter æquilongis multifloris; *floribus* 4-meris pedicellis ±10 mm. long. bracteatis calyces facile excedentibus fultis; *ovario* 2·5 mm. long. turbinato calycem subæquante; *calycis* limbo fere basin usque diviso segmentis oblongis obtusissimis apice sæpe recurvis; *corollæ* albæ tubo elongato (31·5 mm. long.) lobos ovato-oblongos acutos 4-plo excedente; *staminibus* exsertis ore corollæ insertis; *stylo* exserto stigmate 2-ramoso coronato 36 mm. long.

Plaine des Lacs; uncommon on banks of Riv. du Carénage; serpentine; 600 ft. 300.

Var. ANGUSTA. *Folia* anguste oblongo-ovata, plerumque 8–11 × 2·5–3·5 cm. Ceteroquin uti in typo. Mont Dore; abundant in 12-foot scrub, 2000 ft.; serpentine. 692.

I. florida is evidently near *I. Francii* Schlechter & K. Krause judging from the description of the latter: the chief points of difference are seen in the longer-pedicelled flowers of *I. florida* and the obtuse segments of the calyx.

I. COMPTONII S. Moore, sp. nov. *Arbuscula* fere 5-metralis; *ramulis* validis glabris cortice cinereo obductis superne foliosis; *foliis* plerumque 11–20 × 6·5–9 cm. brevipetiolatis late ovato-oblongis apice rotundatis nisi obtusissimis vel subito cuspidulatis basi rotundato-cordatis pergamaceis costis pag. inf. ferrugineis exemptis glabris costis lateralibus utrinque 9–11 mediocriter visibilibus; *stipulis* ovatis acuminatis cito deciduis; *cymis* 4–6 × 7–10 cm. foliis brevioribus paniculatis multifloris; *pedicellis* circa 1 mm. long. bracteis subulatis 2–3 mm. long. onustis; *ovario* oblongo-ovoideo calyce breviore; *calycis* limbo 4-lobo 2·5 mm. long. lobis obtusis dorso carinulatis; *corollæ* puniceæ 4-meræ amygdalodoræ tubo superne levissime ampliato 27 mm. long. lobis ovato-oblongis acutis vel obtusis quam tubus plusquam 4-plo brevioribus; *staminibus* ore corollæ affixis antheris 5 mm. long. filamentis manifestis suffultis; *stylo* breviter exserto; *stigmatis* ramis lineari-lanceolatis acutis.

Ignambi; creekside forest; 1000 ft.; gneiss. 1604.

This can be distinguished at a glance from *I. coccinea* L. by the foliage and the obtusely ending buds of the flowers.

PAVETTA OPULINA DC. Île Mouac; abundant in moister Niaouli association; sea-level. 2352. Shrub 6 ft. Corolla white, with slight scent. Western Polynesia.

COFFEA ARABICA L. Mont Mou; forest margin, 1000 ft.; serpentine. 469. Doubtless an escape from cultivation.

MORINDA CITRIFOLIA L. Baie Kuakué; uncommon in littoral zone. 880. From India through the Archipelago to Australia and Polynesia. Frequently cultivated.

M. FORSTERI Seem. Ouen Toro; in *Acacia spirorbis* woods; 0–500 ft. 775. Woody climber; stout stems. Fruits slightly fleshy with a few hard seeds. Polynesia.

M. FALLAX Schlechter. Mont Mou; edge of damp gully forest; cretaceous; 800 ft. 546. Liane reaching about 10 ft. Corolla white.

M. PHILLYREOIDES Labill. Taom; serpentine scrub; 2500 ft. 2344. Small shrub 2 ft. Flowers white, scented.

M. LIGUSTRINA S. Moore, sp. nov. *Arbuscula* glabra habitu fruticoso; *ramulis* sat gracilibus inferne nudis cicatricibusque foliorum delapsorum frequenter signatis brunneis superne crebro foliosis et saltem in sicco fuscis; *foliis* parvis ± 15 × 7 mm. raro usque 2·5 cm. long. petiolatis oblongo-ovatis obtusis basi obtusis firme membranaceis costis lateralibus utrinque 4–5 ut reticulum laxum inconspicuis pet. 4–5 mm. long.; *stipulis* connatis acutis sursum membranaceis necnon cito deciduis deorsum coriaceis decoloribus diutuleque persistentibus 1·5 mm. long.; *capitulis* axillaribus 2–3-floris (floribus revera interdum solitariis) breviter pedunculatis; *ovario* 2·5 mm. long. ovoideo calyce longiore; *calyce* tubuloso ore undulato-denticulato; *corolla* 4-mera 7 mm. long. in alabastro ampullæformi fere usque medium in lobos lineari-lanceolatos obtusos crassiusculos divisa intus minute puberula; *staminibus* juxta medium tubum insertis inclusis; *stylo* incluso glabro 3 mm. long.; *stigmatis* ramis lineari-oblongis obtusis stylo subæquilongis; *ovulo* septo affixo.

Ignambi; scrubby summit forest, 4250 ft.; gneiss. 1580.

In appearance much like *M. phillyreoides* Labill., but smaller generally in the foliage and very different in flower.

PSYCHOTRIA SPECIOSA S. Moore, comb. nov. (*Mapouria speciosa* Beauvis. ex descript.) Mont Dore; *Casuarina* association; 300 ft.; serpentine.

840. Kuakué; abundant in alluvial plain forest; serpentine; 50 ft. 893. Comboui Mts.; forest near creek; 2500 ft.; serpentine. 2180. Shrub 5–6 ft. Corolla rose or pink, scentless. Berries spherical, blue-violet.

Var. LONGIFOLIA, var. nov. A typo discrepat ob folia longiora (usque ad 18 × 5 cm.) costa rubiginosa percursa, filamenta longiora ita stamina longius exserta, stigmatis ramos duplo longiores tenuioresque.

Riv. Ngoyé; in *Casuarina-Agathis* forest; 400 ft.; serpentine. 2061. Shrub 6 ft. Flowers rosy-red, scentless.

PSYCHOTRIA SUAVEOLENS S. Moore, sp. nov. *Frutex* bimetralis, glaber; *ramulis* tenuibus inferne cicatriciferis superne foliosis; *foliis* 4–6 × 1·2–2 cm. lanceolatis vel lanceolato-oblongis apicem versus sæpe acuminatis apice ipso obtusis vel acutis basi in petiolum 1–2 cm. long. attenuatis membranaceis pagina utraque opacis costis lateralibus utrinque circa 6 inconspicuis; *stipulis* inter se liberis triangularibus acutis 2–3 mm. long.; *floribus* 5-meris inter minores in cymam pedunculatam laxe trichotomam 3·5 × 4 cm. digestis; *pedicellis* filiformibus quam flores interdum brevioribus interdum usque 1 cm. long. bracteas parvulas excedentibus; *ovario* 1 mm. long. turbinato quam calyx cupularis obscure denticulatus longiore; *corollæ* albæ tubo infundibulari intus in medio pubescente 7 mm. long. quam lobi ovato-oblongi obtusi paullo longiore; *antheris* juxta medium tubum insertis inclusis 2·5 mm. long.; *stylo* exserto ramis stigmatosis prominentibus coronato 8·5 mm. long.

Paompai; forest; 500 ft.; locally frequent. 1890.

Judging from Baillon's description, this must be near his *Uragoga ligustrina*, which is said to have oblong-obovate subcoriaceous leaves shining on the upper side, connate stipules, subdichotomous cymes, and a smaller "tubular" corolla. The flowers, although white when living, dry red, and this gives the specimens somewhat the appearance of *P. speciosa*, a plant in several respects diverse.

P. RUPICOLA Schlechter. Kuakué; 50 ft.; *Spermolepis* forest by river. 947. Nekando; *Spermolepis* forest; 500 ft. 2115. Unbranched, 3 ft., but certainly gets bigger than that. Inflorescence white. Corolla white with white hairs in throat.

P. COMPTONII S. Moore, sp. nov. *Fruticulus* ramosus metralis; *ramulis* subteretibus superne crebro foliosis in sicco nigrescentibus puberulis cito glabrescentibus; *foliis* 10–14 × 2·5–5 cm. lanceolato-ellipticis vel oblongo-obovatis apice breviter lateque acuminatis ipso obtusis basi in petiolum 1·5–2 cm. long. extenuatis coriaceis supra glabris opacisque subtus minutissime argenteo-lepidotis; *stipulis* connatis caulem laxe vaginantibus apice obtusis margine ciliolatis 5–8 mm. long.; *floribus* breviter pedicellatis in

paniculam cymosam laxam pluries trichotomam crebro bracteatam puberulam 10 × 10 cm. ordinatis ramulis ultimis griseo-pubescentibus cymulam 2–3-floram ferentibus; *bracteis* 1·5–5 mm. long. oblongo-lanceolatis obtusis acutisve pedicellis longioribus; *ovario* oblongo-ovoideo griseo-pubescente quam calyx breviore; *calyce* 2·5 mm. long. campanulato fere glabro vix usque medium 5-lobo lobis ovatis obtusis; *corollæ* 5-meræ tubo 7·5 mm. long. infundibulari extus griseo-pubescente intus ore faucibusque villoso quam lobi oblongi obtusissimi ter longiore; *antheris* faucibus affixis oblongis obtusis inclusis 2 mm. long.; *stylo* incluso glabro 8 mm. long.

Cap Bocage; frequent in serpentine scrub; 100–1300 ft. 1373.

This is near *P. rupicola* Schlechter, but the latter's foliage, pedicelled flowers, calyx and corolla diverge in several respects.

PSYCHOTRIA FRONDOSA S. Moore, sp. nov. *Arbor* 9-metralis; *ramulis* validis compressis sursum foliosis uti inflorescentia et innovationes tomento ferrugineo vestitis deinde glabrescentibus; *foliis* 9–20 × 3·5–10 cm. amplis petiolatis ovatis apice sæpe cuspidato-attenuatis ipso obtusis basi cuneatis pergamaceis pag. sup. mox glabris pag. inf. in costis ferrugineo-pubescentibus; *stipulis* circa 3 mm. long. quam petioli multo brevioribus connatis cupularibus apice breviter dentatis diutule persistentibus; *floribus* sessilibus in cymam bis trichotomam paniculatam satis longe pedunculatam 7–9 × 5·5–7 cm. e cymulis pluribus plerumque 5–7-floris constantem dispositis; *bracteis* circa 2 mm. long. latissime rotundatis margine undulatis uti flores extus ferrugineis; *ovario* 1 mm. long. obovoideo quam calyx campanulatus ore breviter dentatus duplo breviore; *corollæ* albæ tubo infundibulari intus (basi exempta) pubescente quam lobi ovato-oblongi obtusi duplo longiore 12 mm. long.; *antheris* inclusis paullo infra fauces affixis oblongis obtusis 3 mm. long.; *stylo* incluso minute pubescente 7·5 mm. long.; *stigmatis* ramis lineari-oblongis obtusis.

Mont Canala; forest; 1000 ft.; frequent; mica schists. 1176.

Recognised among New Caledonian species by the peduncled open inflorescences composed of flowers packed closely together in stalked few-flowered cymules—this together with the foliage and the indumentum.

P. PUBITUBA S. Moore, sp. nov. *Frutex* vel arbuscula; *ramulis* validis primo uti inflorescentia sparsim fulvo-velutinis cito glabris siccitate nigrescentibus; *foliis* 20 × 7·5 cm. longe valideque petiolatis (pet. 6 cm. long.) oblongo-obovatis obtusis basi gradatim extenuatis papyraceis pag. sup. costa media prope basin ferruginea exclusa glabris pag. inf. in costis pubescentibus alibi sparsissime puberulis necnon microscopice lepidotis costis lateralibus utrinque 11 maxima pro parte oppositis vel suboppositis; *stipulis* late ovatis apice incisis dorso sparsim pubescentibus; *floribus* 5-meris in cymam laxam paniculatam pedunculatam ter trichotomam petiolis æquilongam e cymulis multis plurifloris compositam ordinatis; *bracteis* 1·5–2·5 mm. long. ovatis obtusis acutisve; *ovario* subgloboso calyci æquilongo; *calyce* 1 mm. long. cupulari 5-dentato; *corollæ* dilute cæruleæ tubo lato subcylindrico extus dense pubescente intus infra fauces villoso 6·5 mm. long. triente sup. in lobos oblongos apice incurvo-incrassatos intus omnino extus fere omnino glabris; *staminibus* faucibus affixis exsertis filamentis 2 mm. long. quam antheræ longioribus; *stylo* breviter exserto glabro 7 mm. long.

Tonine; abundant in forest; 2000–3000 ft. 1974.

Near *P. Poissoniana* S. Moore, comb. nov. (*Uragoga Poissoniana* Baill.), but with a different indumentum, narrower leaves on shorter stalks, shorter corolla with lobes nearly glabrous outside instead of densely hairy like the tube, and stamens inserted in the throat instead of beneath it. The blue corollas, too, should be mentioned.

PSYCHOTRIA DECLIEUXIOIDES S. Moore, sp. nov. *Frutex* metralis fere omnino glaber; *ramulis* validis dichotomis cortice cinereo circumdatis inferne nudis necnon intervallis brevibus prominenter cicatriciferis superne paucifoliatis; *foliis* 3–5·5 × 1·5–2·5 cm. obovatis vel obovato-lanceolatis obtusis vel obtusissimis ima basi in petiolum 5 mm. long. coartatis coriaceis supra glabris nitidisque subtus minutissime lepidotis; *stipulis* cupularibus truncatis ciliatis mox dehiscentibus; *cymis* terminalibus paniculatis 6 × 4 cm. ter trichotomis cymulis pluribus sæpius 2–3-floris floribus sessilibus brevissimeve pedicellatis; *bracteis* circa 1 mm. long. subulatis puberulis; *ovario* turbinato calyci æquilongo ·75 mm. long.; *calyce* cupulari 5-dentato dentibus ciliatis; *corolla* sordide alba parva subrotata tubo 2·5 mm. long. cylindrico extus puberulo intus in faucibus villoso lobis oblongis obtusis tubo æquilongis; *staminibus* faucibus affixis subinclusis antheris obtusis 2·25 mm. long.; *stylo* incluso 2 mm. long.

Presqu'île Bogota; serpentine scrub; 1500 ft. 1325.

A distinct species with a fair amount of resemblance to some species of *Declieuxia*, whence the proposed trivial.

P. LAXISSIMA S. Moore, sp. nov. *Arbuscula* 8-metralis; *ramulis* aliquanto compressis cortice griseo-brunneo obductis puberulis mox glabris; *foliis* 14–16 × 5·5–5·7 cm. petiolatis (pet. 3–3·5 cm. long.) ovato-oblongis prope apicem attenuatis apice obtusis basi rotundatis levissimeque cordulatis membranaceis supra glabris subtus in costis minutissime puberulis costis lateralibus utrinque 13–14 pag. inf. magis prominentibus; *stipulis* connatis apice truncatis margine ciliolatis 4 mm. long.; *inflorescentia* pedunculata fere 20 × 14 cm. minute puberula laxissime cymoso-paniculata ramulis lateralibus ter trichotomis ramulo centrali pluries trichotomo cymulis 2–3-floris; *floribus* parvis 5-meris flore centrali sessili floribus lateralibus breviter pedicellatis; *bracteis* exiguis (circa 1 mm. long.) subulatis; *ovario* turbinato 1 mm. long. calycem cupularem denticulatum excedente; *corolla* alba rotata tubo 1·2 × 2 mm. cylindrico intus in faucibus villoso lobis oblongo-lanceolatis apice incurvo-crassiusculis 2·25 mm. long.; *antheris* faucibus affixis breviter exsertis vix 1 mm. long.; *stylo* breviter exserto glabro 1·5 mm. long.; *stigmatis* ramis prominentibus.

Mont Canala; streamside in forest; 2000 ft.; mica schist. 1238.

In foliage this in some degree resembles *P. Baillonii* Schlechter, but the shining leaves of that species have fewer side nerves, its stipules are differently shaped, the inflorescence is greatly contracted and the flowers are considerably larger.

PSYCHOTRIA COLLINA Labill. Port Déspointes woods; Nouméa. 141. Mont Mou; margin of gully forest and Niaouli zone; cretaceous; 800 ft. 551. Flowers greenish. Inflorescence much larger and more effuse than is the case with Labillardière's co-type in the National Herbarium.

P. SUBPALLENS S. Moore, sp. nov. *Frutex* glaber ultrametralis; *ramulis* inferne subteretibus superne aliquanto compressis fere a basi foliosis pallidis; *foliis* 6·5–10 × 2–4·5 cm. lanceolatis vel lanceolato-ovatis acuminatis apice obtusis (nonnunquam retusis) basi in petiolum 3–8 mm. long. extenuatis margine leviter revolutis papyraceis costis lateralibus utrinque 6–8 pag. utravis mediocriter visibilibus; *stipulis* 2 mm. long. quadratis apice truncatis fugaceis; *cymis* terminalibus pedunculatis laxe paniculatis ter trichotomis usque 5 × 5 cm. cymulis pluribus plerumque 3-floris floribus breviter pedicellatis; *bracteis* 1 mm. long. subulatis; *pedicellis* 1–2 mm. long. ovarium plerumque excedentibus; *ovario* turbinato-oblongo quam calyx breviore; *calyce* 1·5 mm. long. cupuliformi ore denticulato; *corolla* parvula 4-mera tubo lato ex calyce haud eminente extus glabro intus in faucibus villoso 1 mm. long. lobis auguste oblongo-ovatis obtusis 2 mm. long.; *antheris* corollæ ori affixis exsertis fere 2 mm. long.; *stylo* vix exserto ramis oblongis obtusis; *fructu* 6 mm. long. ovoideo prominenter bicarinato calyce persistente coronato.

Mont Dore; stream-valley woods; 100 ft. 662.

Near *P. collina* Labill., differing from it in foliage and in some respects in the flowers.

P. RARIFOLIA S. Moore, sp. nov. *Frutex* vel *arbuscula* glabra; *ramulis* dichotomis in sicco nigrescentibus inferne nudis distanterque cicatriciferis superne paucifloris; *foliis* 4·5–8·5 cm. long. 2–3·5 cm. lat. breviter petiolatis oblongo-obovatis obtusis basi cuneatis coriaceis supra nitidis glabris costis lateralibus utrinque 6–10 mediocriter aspectabilibus; *stipulis* cito evanidis; *floribus* 5-meris in cymam terminalem circa 2·5 cm. in transversum sessilem oligantham (3–5) digestis pedicellis nullis vel subnullis; *bracteis* parvulis subulatis; *ovario* 2 mm. long. turbinato in longitudinem sulcato calycem

tubulosum impariter 5-dentato-lobulatum semiæquante; *corollæ* albæ tubo subcylindrico (sursum gradatim leviter ampliato) extus glabro intus ore faucibusque breviter villoso alibi summum piloso 14 mm. long. lobis 9–10 mm. long. oblongis obtusis apice crassiusculis facie puberulis dorso glabris; *antheris* paullulum infra fauces insertis inclusis apiculatis 4 mm. long.; *stylo* glabro incluso 11 mm. long.

Mont Canala; forest; 2000–3000 ft.; mica schists. 1114.

Affinity with *P. microglossa* Guillaum., which it resembles a good deal in foliage, but the flowers of the two are different in several respects.

Under the same number there is a specimen, apparently conspecific, with narrower scattered pairs of leaves, longer corollas with the 18 mm. long tube sometimes much narrowed below but sometimes (on the same specimen, of course) cylindrical like that of the type, and a calyx with somewhat shorter teeth. This has ovate stipules, somewhat incised here and there and about 7 mm. long.

No. 1418 from Mont Arago, forest, 1000 ft., mica schists, has the narrow-tubed corolla just referred to: the leaves are like those of the type but somewhat smaller and, like them, dry green, whereas the scattered leaves of the other dry brownish.

PSYCHOTRIA ROSEO-TINCTA S. Moore, sp. nov. *Arbuscula* glabra fere 4-metralis; *ramulis* dichotomis cortice cinereo obductis inferne nudis necnon in nodis cicatriciferis apicem versus paucifoliosis; *foliis* 3·5–4 × 1·2–1·5 cm. oblanceolatis obtusis basi in petiolum 4–8 mm. long. breviter augustatis margine revolutis coriaceis costis lateralibus utrinque circa 4 obscuris; *stipulis* 3–4 mm. long. inter se liberis ovatis apice breviter bifidis diutule persistentibus; *floribus* 5-meris pedicellatis in cymas laxe trichotomas pedunculatas usque 5 × 5 cm. e cymulis perpaucis pedunculatis 1–4-floris sistentes digestis; *bracteis* circa 2 mm. long. subulatis; *ovario* 1·5 mm. long. cylindrico quam calyx cupularis 5-dentatus paullo breviore; *corollæ* inferne albæ superne dilutissime roseæ tubo infundibulari extus et intus glabro 19 mm. long. lobis oblongis obtusis 7·5 mm. long.; *antheris* faucibus affixis inclusis 4 mm. long.; *stylo* 11 mm. long. incluso glabro; *stigmatis* ramis lineari-oblongis obtusis exsertis.

Ignambi; intermediate forest; 3000 ft.; gneiss. 1703.

To be inserted next to *P. calorhamnus* Guillaum., of which the foliage diverges in several respects.

P. CALORHAMNUS Guillaum. Poume; serpentine scrub; 400 ft.; rare. 2358. Low shrub 1 ft. Corolla white, slightly fleshy.

P. LEPIDOCALYX S. Moore, sp. nov. *Frutex* elatus 2½-metralis; *ramulis* dichotomis paucifoliosis uti innovationes ferrugineis cito glabrescentibus;

foliis 5–8 × 1·5–2·5 cm. oblanceolatis vel oblanceolato-oblongis obtusis basi in petiolum circa 7 mm. long. extenuatis margine apiceque pilosis supra glabris subtus in nervis appresse ferrugineis; *stipulis* 15–17 mm. long. oblongo-ovatis apice bifidis dorso pilis appressis strigillosis ferrugineis munitis; *cymis* usque 3 × 4 cm. terminalibus paucifloris pedunculo communi sæpius 0 vel fere 0 pedunculis ord. secundi dichotomis ord. tertii cymulam sæpissime 3-floram fulcientibus; *bracteis* circa 2 mm. long. lanceolatis; *floribus* brevissime pedicellatis; *ovario* 1 mm. long. subcylindrico uti pedicelli dense chryso-ferrugineo; *calyce* 5 mm. long. tubuloso-campanulato sparsim minuteque albo-lepidoto aliter fere glabro ore dentato dentibus ferrugineis; *corollæ* albæ 5-meræ extus dense ferrugineo-villoso tubo 14 mm. long. late infundibulari intus basin versus villoso ceterum glabro lobis ovato-oblongis obtusis 3 mm. long.; *staminibus* faucibus affixis inclusis antheris fere 3 mm. long.; *stylo* incluso glabro 11 mm. long.; *stigmatis* ramis linearibus abbreviatis.

Ignambi; frequent in forest; 3500–4200 ft. 1583.

On comparing this with the description of *P. oubatchensis* Schlechter, two important discrepancies emerge without counting the subcapitate inflorescence, namely the stipules which are said to be short, whereas in the plant under notice they are remarkably large, and the calyx described as truncate and villous.

Psychotria toninensis S. Moore, sp. nov. *Frutex* 3-metralis; *ramulis* dichotomis inferne nudis superne sparsim foliosis uti innovationes dense ferrugineo-hirsutis subinde glabrescentibus; *foliis* 8–11 × 2·3–3 cm. petiolatis (pet. 1·5 cm. long.) oblongo-lanceolatis acutis basi obtusis margine crebro dentato-undulatis pag. sup. bullatis utrobique præsertim in nervis ferrugineo-hirsutis; *stipulis* circa 7 mm. long. fugaceis lanceolatis dorso ferrugineis; *cymis* foliis brevioribus usque 8 cm. in transversum laxe bis 2–3-chotomis ferrugineis pedunculo communi nullo cymulis pluribus plerumque 3-floris floribus sessilibus pedentibus; *bracteis* exiguis subulatis; *ovario* 1·5 mm. long. subgloboso dense ferrugineo calyci poculiformi ore denticulato sparsim hirsuto vix æquilongo; *corolla* alba 5-mera infundibulari tubo 20 mm. long. extus fulvo- vel sordide albo-villoso intus basin versus villoso alibi summum minute puberulo lobis triangularibus obtusis 4 mm. long.; *staminibus* faucibus affixis subinclusis filamentis 2 mm. long. antheris fere æquilongis; *stylo* incluso glabro 11 mm. long.; *stigmatis* ramis plumulosis 4 mm. long.

Tonine; in forest shade; 3000 ft. 1940.

Affinity with the preceding. The bullate foliage is a striking feature.

P. gneissica S. Moore, sp. nov. *Frutex* ramosus, glaber; *ramulis* inferne nudis cicatricibusque subsparsim signatis superne paucifoliatis; *foliis* 4·5–7 × 1·8–3 cm. anguste obovato-oblanceolatis apice sæpe subito cuspidato-attenuatis ipso obtusis interdum retusis basi in petiolum brevem coartatis tenuiter coriaceis costis lateralibus utrinque circa 5 tenuibus pag. sup. visu difficilibus ; *stipulis* connatis ovatis apice bifidis ; *cymis* 5–7 × 4–6 cm. terminalibus pedunculatis paucifloris semel vel bis 2–3-chotomis cymulis centralibus 2–3-floris floribus breviter pedicellatis ; *bracteis* 2–3 mm. long. subulatis ; *ovario* 2 mm. long. subcylindrico quam calyx breviter tubulosus 5-dentatus paullo breviore ; *corolla* alba cylindrica intus minute sericea tubo 24 mm. long. lobis oblongis obtusis 14 mm. long. ; *antheris* 5·5 mm. long. semiexsertis juxta medium tubum affixis filamentis filiformibus circa æquilongis ; *stylo* incluso 9 mm. long.

Ignambi ; frequent in moist forest ; 3500–4200 ft. ; gneiss. 1514.

Psychotria patula S. Moore, sp. nov. *Frutex* orgyalis, glaber ; *ramulis* subteretibus cortice brunneo obductis omnimodo foliosis ; *foliis* 6–10 × 1·8–3 cm. brevipetiolatis oblongo-oblanceolatis acuminatis apice obtusis basi cuneatis papyraceis costis lateralibus paucis tenuibus mediocriter interdum male aspectabilibus ; *stipulis* inter se liberis ovatis bifidis 6·5 mm. long. ; *cymis* axillaribus graciliter pedunculatis (ped. 2–2·5 cm. long.) patulis semel 2–3-chotomis igitur 2–3 floris ; *pedicellis* tenuibus quam flores brevioribus ; *bracteis* circa 1 mm. long. subulatis ; *ovario* 1·75 mm. long. subcylindrico calyci cupulari denticulato æquilongo ; *corollæ* albæ 4-meræ tubo anguste infundibulari intus glabro 12 mm. long. lobis oblongis obtusis crassiusculis circiter æquilongo ; *antheris* corollæ ori affixis breviter exsertis 4 mm. long. ; *stylo* 6 mm. long. ; *stigmatis* ramis lineari-subulatis.

Mt. Panié ; forest ; 1500 ft. 1788.

Affinity apparently with *P. trichopodantha* Guillaum., which is described as having somewhat diverse membranaceous leaves and smaller solitary flowers.

P. monanthos Schlechter. (*Uragoga monanthos* Baill. ex descript.) Nekando ; *Spermolepis* forest ; 1000 ft. ; serpentine. 975. Comboui Mts. ; creekside forest ; 1500 ft. ; serpentine. 2175.

This is the plant referred to by Schlechter (No. 15157) as *Psychotria phyllanthoides* Schlechter, said to be a synonym for *Uragoga phyllanthoides* Baill., which name does not appear in the 'Index Kewensis,' and, search for the description having failed, is presumed to be a *nomen nudum*. The specimens, however, answer the description of *U. monanthos* Baill. fairly well, especially as concerns the flower, although some doubt must naturally attach to the identification.

Cephaëlis Balansæ S. Moore, comb. nov. (*Uragoga Balansæ* Baill. ex descript.) Mt. Humboldt ; 1020. Small tree, 20 ft. Mauve flowers.

Some uncertainty must remain here, as Baillon's description leaves several points of importance unnoticed. Baillon alludes to his plant as a small shrub 2–3 metres high, but this may have been a precociously flowering example.

CEPHAËLIS FAGUETI S. Moore, comb. nov. (*Uragoga Fagueti* Baill.) Ignambi; moist forest; 2500–4250 ft. 1851. Shrub 6 ft. Flowers white, woolly, scentless.

C. SCHUMANNIANA S. Moore, comb. nov. (*Psychotria Schumanniana* Schlechter.) Mt. Canala; fairly frequent in deep shade of forest; 1500–2000 ft. 1113. Shrub 2 ft. Flowers white, woolly.

Leaves narrower and with shorter petioles than those of *Schlechter* 15400, and inflorescence somewhat more open; the hairs, too, of the corolla are rusty instead of white. Possibly a distinct though closely related species, Guillaumin (Not. System. ii. 197) considers this to be a form of the preceding, but the two seem scarcely conspecific.

C. SALTIENSIS S. Moore, sp. nov. *Arbuscula* fere 4-metralis; *ramulis* patentibus interdum aliquanto anfractuosis apicem versus foliosis cortice cinereo rimoso obductis cicatriciferis (haud prominenter) glabris in sicco nigrescentibus; *foliis* 6–8 × 2·2–2·5 cm. oblanceolatis obtusis basi in petiolum ± 5 mm. long. gradatim extenuatis pergamaceis supra glabris opacisque subtus minutissime furfuraceis necnon secus costæ mediæ dimidium proximale dense ferrugineis; *stipulis* 7–8 mm. long. connatis apice incisis dorso rubiginosis mox dehiscentibus; *inflorescentia* terminali quam folia multo breviori; *floribus* sessilibus in cymulas paucas paucifloras tandem usque 2 cm. pedunculatas digestis pedunculo communi 0; *bracteis* usque 5 mm. long. basi latiusculis plerumque incisis superne linearibus (interioribus integris) ciliatis; *ovario* subcylindrico calyce breviore; *calyce* 2·5 mm. long. ultra medium in lobos inequales oblongos vel triangulares obtusos ciliatos diviso; *corollæ* sordide cyanæ tubo comparate lato cylindrico extus pubescente intus ore villoso 5 mm. long. lobis oblongis obtusis tubum fere duplo excedentibus; *staminibus* ori corollæ affixis exsertis filamentis 5·5 mm. long. antheris 2 mm. long.; *stylo* exserto glabro; *stigmatis* ramis clavellatis; *fructu* subgloboso 5-costato in sicco nigro 4 × 3 mm.

Mt. Mou; coniferous forest; 3500 ft.; serpentine. 490.

C. RUBEFACTA S. Moore, sp. nov. *Frutex* elatus, ramosus, fere 4-metralis; *ramulis* superne paucifoliosis inferne nudis subdistanterque cicatriciferis rubiginoso-villosis dein glabrescentibus; *foliis* 11–20 × 4–5·5 cm. amplis obovato-oblongis apicem versus attenuatis apice obtusis basi in petiolum 1–1·5 cm. long. cuneatim attenuatis membranaceis in nervis pag. utriusque ferrugineo-villosis alibi sparsim appresse pubescentibus costis lateralibus utrinque circa 9 pag. sup. inconspicuis pag. inf. eminentibus; *capitulis* circe 4 cm. diam. terminalibus plurifloris rubiginoso-villosis; *bracteis* pluribus ovato-lanceolatis longe acuminatis uti calyx et ovarium rubiginoso-villosis circa 3 cm. long.; *ovario* turbinato circa 2 mm. long.; *calyce* 16 mm. long. sacculato-tubuloso inæqualiter 5–6-lobato lobis triangularibus acutis 1–3·5 mm. long.; *corollæ* albæ ex calyce longe eminentis tubo infundibulari inferne glabro superne scabride pubescente intus in faucibus pubescente 4 cm. long. lobis 5 anguste ovato-oblongis obtusis extus scabride pubescentibus intus glabris; *antheris* 3·5 mm. long. corollæ faucibus affixis linearibus acutis quam filamenta longioribus; *stylo* exserto superne crebro minuteque papilloso 4·5 cm. long.; *stigmate* 2-ramoso.

Mt. Mou; forest of gully in serpentine; 1500 ft. 435.

Conspecific with this are undoubtedly fruiting specimens collected by Schlechter at Ngoyé (No. 15096). Its black pyrenes are subcordate in shape, flat on the opposed faces, and keeled down the back: they measure when moistened 11 mm. in length, and as much in width near the bottom. The affinity of the species is with *C. Pancheri* (*Uragoga Pancheri* Baill.), which has a diverse indumentum, leaves not drawn out at the base, longer peduncles, and smaller bracts, among other features.

CEPHAËLIS BOUVARDIOIDES S. Moore, sp. nov. *Frutex* bimetralis; *ramulis* superne foliosis fusco-villosis dein glabrescentibus; *foliis* 5–10 × 1–1·5 cm. petiolatis (pet. 5–10 mm. long.) oblongo-lanceolatis acutis basi angustatis firme membranaceis pag. sup. appresse villosulis pag. inf. griseo-villoso-tomentosis costis lateralibus utrinque pluribus (10–14) pag. inf. solummodo visibilibus; *stipulis* basi connatis ambitu obovatis extus villosis sursum in lobos plures anguste lineares acuminatus divisis usque 12 mm. long.; *capitulis* terminalibus breviter pedunculatis pauci- ac densifloris villosis 1·5 cm. diam.; *bracteis* pluribus e basi lata integra incisave lineari-lanceolatis acuminatis ±17 mm. long.; *floribus* subsessilibus 5-meris; *ovario* turbinato dense villoso 1 mm. long.; *calyce* 6·5 mm. long. tubuloso medium usque in lobos oblongos acutos diviso; *corollæ* albæ tubo superne brevissime dilatato extus villoso intus in faucibus piloso 29 mm. long. lobis 6 mm. long. ovato-oblongis obtusis tubo multo brevioribus extus villosis intus glabris; *antheris* faucibus affixis inclusis obtusis vix 3 mm. long.; *stylo* incluso glabro 14·5 mm. long.; *stigmatis* ramis prominentibus.

Ignambi; forest margin; 2000 ft.; frequent; gneiss. 1477.

This very distinct plant is quite unlike anything in our herbaria. In some respects Baillon's description of his *Uragoga Vieillardi* (Adans. xii. 224) would seem to fit it, except for the stipules, which are said to be ciliate only and subequal in length to the petioles (5 mm.); the corolla also is described as "breviuscula" (measurements are not given), which certainly is not the case with the plant under notice.

C. CARDIOCHLAMYS S. Moore, comb. nov. (*Uragoga cardiochlamys* Baill.) River Ngoyé; *Spermolepis* forest; 400 ft.; serpentine. 2052. Shrub 6 ft. Flowers white, sweet-scented.

NORMANDIA NEOCALEDONICA Hook. f. Baie Ngo; Plaine des Lacs; serpentine scrub; sea-level—2600 ft. 268, 297. Mt. Mou; dry serpentine scrub; 2000 ft. 430. Baie Kuakué; serpentine scrub; 300 ft. 885. Low, erect shrub 2 ft. Flowers white or with a slight pink tinge, scentless.

COMPOSITÆ.

AGERATUM CONYZOIDES L. A weed in ditches of town of Nouméa. 30, 94. Weed of wide distribution.

LAGENOPHORA BILLARDIERI Cass. Mt. Mou; serpentine scrub of summit; 3500 ft. 574. Mt. Dore; frequent in dry serpentine scrub; 800 ft. 675. S. and S.E. Asia and Indian Archipelago.

L. NEOCALEDONICA S. Moore, sp. nov. Acaulis, semispithamea vel fere spithamea; *foliis* ±2·5 cm. long. 6–9 mm. lat. rosulatis e caudice crasso lanoso enatis oblanceolatis obtusis in petiolum ±1 cm. long. sensim angustatis margine calloso-dentatis tenuiter coriaceis margine piloso-ciliatis utrobique microscopice papillosis; *scapis* folia longe superantibus gracilibus monocephalis puberulis bracteis paucis 2–3 mm. long. linearibus distanter præditis 10–15 cm. alt.; *involucri* phyllis 3×1·25 mm. 2–3-serialibus ovato-oblongis obtusissimis margine leviter scariosis ciliatisque; *receptaculo* convexo; *radii* flosculis 14 disci 25 his omnibus versimiliter sterilibus; *ligulis* albis ovato-oblongis minute emarginatis 4 mm. long.; *styli ramis* angustis appendicibus lineari-lanceolatis coronatis in toto 1·5 mm. long.; *achæniis* radii oblongo-obovoideis apice brevissime contractis primo insigniter deinde multo minus compressis glabris epapposis 3 mm. long.

Taom; rare on bare red serpentine earth; 2500 ft. 2305.

Has leaves of thicker texture than those of *L. Billardieri* Cass. and a different involucre and ligules, besides smaller, less flattened ripe achenes with but slight indication of narrowing at the tip.

ERIGERON BONARIENSIS L. Mt. Mou; 800 ft. 555. A South American plant now widely dispersed.

E. NEOCALEDONICUS S. Moore, sp. nov. *Herba* summum metralis; *caule* erecto ramoso striato sicut ramuli graciles microscopice puberulo dein glabro; *foliis* inferioribus 3–5 cm.×2·5–4 mm. superioribus 1–2 cm. long. sessilibus linearibus vel anguste lineari-oblongis acute mucronulatis basi obtusis necnon subobscure decurrentibus junioribus gradatim imminutis; *capitulis* pro rata submediocribus heterogamis radiatis (etsi nequaquam manifeste) circa 30-flosculosis ad apicem ramulorum in paniculas apertas copiose bracteatas pleiocephalas circa 15×7–8 cm. ordinatis; *involucri* 8×8 mm. campanulati 3-serialis phyllis anguste lineari-lanceolatis acutis interioribus sensim

longioribus intimis margine scariosis omnibus dorso microscopice puberulis; *ligulis* albis subexsertis 1–1·5 mm. long. 2-serialibus anguste lineari-spathulatis apice bidenticulatis; *styli ramis* leviter complanatis ·5 mm. long. appendicibus æquilongis linearibus præditis; *achæniis* aliquanto compressis oblongis minute pubescentibus obscure costatis 2 mm. long.; *pappi setis* leviter scabriusculis dilutissime rubiginosis 6 mm. long.

Nouméa; roadside weed. 36.

Affinity with *E. linifolius* Willd., but there are too many points of difference to require mention in detail.

Conyza ægyptiaca Ait. Mt. Mou; edge of forest and in Niaouli region; 800 ft. 556. Warmer regions of the Old World.

Blumea canalensis S. Moore, sp. nov. *Herba* fere orgyalis; *caule* erecto subtereti appresse griseo-pubescente; *foliis* usque 20×6–8 cm. junioribus 8×3 cm. amplis subsessilibus ellipticis sub apice angustatis apice ipso acutis basi gradatim coartatis margine dentatis (dentibus approximatis) membranaceis supra sparsim subtus densius griseo-pubescentibus; *capitulis* mediocribus paniculam terminalem pubescentem usque 20×13 cm. referentibus; *bracteis* ultimis linearibus plerisque quam pedunculi proprii brevioribus; *involucri* campanulati 7×8 mm. phyllis 3-serialibus anguste lineari-lanceolatis acuminatis dorso puberulis stramineis extimis quam cetera paullo latioribus; *flosculis* ♀ 50–56, ☿ 2–4; *styli ramis* anguste linearibus obtusis compressiusculis; *achæniis* subcylindricis striatis setulosis adhuc crudis 1 mm. long.; *pappi setis* ima basi connatis levibus sordide albis fere 5 mm. long.

Mt. Canala; by streamside in forest at 1000 ft. in mica schist soil. 1168.

Differs from *B. balsamifera* DC. chiefly in the indumentum, smaller leaves with short petioles and smaller heads.

Gnaphalium luteo-album L. Anse Vata; sandpit and as weed of cultivation. 70. Iguambi, Niaouli association, 1500 ft. on gneiss. 1671. A widely diffused weed.

G. japonicum Thunb. Niaouli-Gleichenia association; frequent at 2000 ft.; gneiss. 1585. E. Asia and Indian Archipelago to New Zealand.

Parthenium hysterophorus L. Nouméa; common weed in town, rarer outside. 33. An introduction from America.

Eclipta erecta L. Nouméa; roadside ditches and moist places. 221. Weed of wide distribution through warmer regions of the world.

Wedelia biflora DC. Ouen Toro; along shore. 60. Cap Bocage; with *Lantana Camara* in weedy area; 200 ft. 1396. Old World tropics.

WEDELIA UNIFLORA S. Moore, comb. nov. (*Wedelia Forsteriana* Endl.) Île Ouéré ; abundant ; straggling over coral sand. 649. Polynesia. This is *Buphthalmum uniflorum* Forst., the type of which is at the British Museum. Hochreutiner (Bull. N. York Bot. Gard. vi. no. 21) has redescribed the plant as *Lipochæta lifuana*. The ripe achenes (not seen by Hochreutiner) are rather those of *Wedelia* than of *Lipochæta*, but the difference between the two seems almost too slight to warrant generic separation.

SPILANTHES ACMELLA L. Nouméa ; common in wet ditches. 37. Widely diffused through warmer regions of the world.

TRIDAX PROCUMBENS L. Ignambi ; roadside ; 1000 ft. 1603. A tropical American weed, now spreading in the Old World. It is not in Guillaumin's list.

GOODENIACEÆ.

SCÆVOLA FRUTESCENS Krause. Tchiem ; littoral sand. 2003. East Indies, Australia, Polynesia.

S. SALIGNA Forst. f. River Dumbéa ; serpentine scrub and in flood plain. 411. Kuakué ; alluvial forest ; sea-level ; serpentine. 896. Port Bouquet ; lowland serpentine scrub and river alluvium ; sea-level. 2236. Isle of Pines ; scrub of serpentine plateau ; 200 ft. 2272.

The following are also referable to this species, namely :—

(1) Ignambi ; abundant in forest margin ; 2000 ft. ; gneiss. 1483. The leaves of this are usually 7 cm. long. The name of FORMA INTERMEDIA is proposed for it.

(2) Plaine des Lacs ; edge of flood plain ; serpentine ; 800 ft. 381. Leaves mostly 9–10 cm. long. It may be termed FORMA LONGIFOLIA.

S. BECKII Zahlbr. Kuakué ; flood plain of river ; 50 ft. ; serpentine lowland scrub. 905.

S. ROTUNDATA S. Moore, sp. nov. *Frutex* metralis ; *caule* erecto simplici valido superne folioso glabro ; *foliis* 8–10 × 3·5–4·5 cm. approximatis obovatis apice late rotundatis basin versus in petiolum 1·5–2 cm. long. extenuatis margine revolutis coriaceis necnon aliquantulum carnosulis glabris supra nitidulis subtus opacis petiolis basi amplificatis ibi intus villosis caulemque arctissime amplectantibus ; *floribus* in paniculam elongatam thyrsiformem puberulam 20 cm. long. digestis ; *bracteis* conspicuis oblongo-obovatis obtusissimis pag. inf. puberulis ima basi villosis 8–12 × 5–7 mm. summis 4 × 2·5 mm. ; *corollæ* albæ 10·5 mm. long. loborum dente terminali alas paullulum superante ; *antheris* apice truncatis 1 mm. long. ; *ovario* ovoideo sericeo calycis (itaque sericei) segmentis oblongis obtuse acuminatis æquilongo.

Baie Ngo ; serpentine scrub ; 200 ft. 262.

Differing from *S. Beckii* Zahlbr., besides the broad leaves rotundate at the top, in the long silky lobes of the calyx and shorter anthers with truncate (not rounded) tips. In Guillaumin's recent revision of the genus as represented in New Caledonia * six species are enumerated, the present plant therefore constituting the seventh.

CAMPANULACEÆ.

WAHLENBERGIA GRACILIS A. DC. Mt. Dore ; frequent on old cultivation and low serpentine hills ; 0–800 ft. 676. Ignambi ; in Niaouli association ; gneiss ; 1000 ft. 1613. East Indies to New Zealand.

EPACRIDACEÆ.

LEUCOPOGON DAMMARIFOLIUM Brongn. & Gris. Presqu'île Bogota ; very abundant in serpentine scrub ; 0–1500 ft. 1329.

L. SEPTENTRIONALE Schlechter. Plaine des Lacs ; abundant on moderate serpentine slopes, lowland. Mt. Dore ; abundant in serpentine scrub to 1000 ft. 700. No. 944*a* from Kuakué, with somewhat longer and relatively narrower leaves but without flowers or fruit, is probably conspecific.

L. CONCAVUM Schlechter. Mountains to north of Ngoyé River ; upland serpentine scrub ; 3000 ft. 2069.

L. ALBICANS Brongn. & Gris. Kuakué ; abundant in serpentine scrub ; 0–1000 ft. 939. Stony fruit with pinkish flesh.

L. CYMBULÆ Labill. Baie Ngo ; abundant in serpentine scrub at 150 ft. and upwards. 249, 256. Mt. Dore ; abundant in lowland serpentine scrub at 1000 ft. 699. Kuakué. 944 *b*. Ngoyé ; among stones in river-bed ; abundant ; serpentine ; 100 ft. 961.

Var. ANGUSTIFOLIUS Brongn. & Gris. Mt. Mou ; abundant along edge of damp gully in Niaouli region ; 800 ft. ; cretaceous. 547.

CYATHOPSIS FLORIBUNDA Brongn. & Gris. Taom ; occasional in serpentine scrub at 1000 ft. 2293.

DRACOPHYLLUM GRACILE Brongn. & Gris. River Ngoyé ; on serpentine margin. 2130.

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* Not. System. iii. 59.

DRACOPHYLLUM RAMOSUM Panch. Baie Ngo; lowland serpentine scrub; 200 ft. 252. Mt. Dore; abundant in serpentine scrub; 100–2500 ft. 697. River Dumbéa; very common in scrub and woods and by streamsides; serpentine; lowland. 821. Port Bouquet; riverside pebbles and alluvium; 50 ft.; serpentine. 2235. Taom; abundant in serpentine scrub; 1000–2000 ft. 2299.

D. INVOLUCRATUM Brongn. & Gris. Mt. Panié; among rocks by river; 1500 ft. Gneiss. 1762.

D. COMPACTUM S. Moore, sp. nov. *Frutex* elatus (fere usque 4-metralis); *caule* pauciramoso erecto valido griseo-pubescente; *foliis* fere usque 30 cm. long. 2·5 cm. lat. imbricatis elongato-lanceolatis longe acuminatis apice obtusis basi vaginantibus margine integris (hac atque illac obsolete serrulatis) longitrorsum plurinervibus rigidis glabris leviter nitidis; *floribus* compactis in verticillos approximatos ordinatis secus rhachin strictissimam validam griseo-hirsutam 30 cm. long. digestos; *pedunculis* circa 1 cm. long. bracteis imbricatis omnino occlusis 1-floris; *bracteis* inf. 2·5–3 cm. sup. 4 cm. long. pluriseriatis ovato-lanceolatis acutis striatis ciliatis dorso puberulis; *sepalis* 3 mm. long. lanceolatis acutis striatis ciliatis; *corollæ* albæ tubo calycem vix excedente cylindrico extus glabro 4 mm. long. lobis oblongis obtusis tubum semiæquantibus; *filamentis* tubo corollæ adnatis antheris 1·5 mm. long. vix omnino inclusis juxta medium filamento affixis bifidis; *ovario* depresse-subgloboso glabro circa 1 mm. diam.; *stigmate* minuto 5-lobo.

Plaine des Lacs; abundant on dry slopes; serpentine lowland. 371.

Near *D. verticillatum* Labill., but readily known from it by reason of the strictly racemose inflorescence, peduncles covered with imbricating bracts, the narrower bracts and sepals, and relatively shorter corolla.

PLUMBAGINACEÆ.

PLUMBAGO ZEYLANICA L. Île Ouéré; littoral zone. 644. Canala; forest. 1335. A species of the Old World tropics now widely diffused.

PRIMULACEÆ.

LYSIMACHIA DECURRENS Forst. Canala; old native cultivation area; 1000 ft.; mica schist. 1173. East Asia, Indian Archipelago, Polynesia.

MYRSINACEÆ.

MÆSA NOVO-CALEDONICA Mez. Mt. Mou; moister part of Niaouli region in forest; 800 ft.; cretaceous. 533. Mt. Dore; stream valley in serpentine; 600 ft. 672. Mt. Humboldt; abundant in forest near creek;

1500 ft.; serpentine. 1028. Ignambi; frequent in forest margin; 1000–2000 ft. Liane ascending to about 15 ft. 1843. Hienghene; forest sea-level; shales. 1923.

Rapanea asymmetrica Mez. Nekando; Conifer forest; 3500 ft.; serpentine. 1084. Shrub 5 ft.

R. grandifolia S. Moore, sp. nov. *Arbuscula* fere 6-metralis; *caule* erecto simplici comparate gracili cortice cinereo aliquantum polito obducto; *foliis* 30–33 × 9·5–10 cm. petiolatis ovato-oblongis basi sicut apice obtusis maxime coriaceis pallidissime nitidis glabris; *inflorescentiis* plurimis ex caule toto erumpentibus pluri- necnon densifloris; *floribus* 5-meris pedicellatis pedunculo 2–5 mm. long. validissimo bracteis parvulis onusto insidentibus; *pedicellis* calycem paullulum excedentibus crassissimis 2·5 mm. long.; *calycis* paullo ultra medium partiti incrassati segmentis ovatis obtusis margine microscopice papillosis pauci- (sæpius 4–6-) punctatis; *corollæ* albæ brunneo-tinctæ tubo 1 mm. long. incluso lobis 3·5 mm. long. per anthesin mox patentibus anguste ovato-oblongis obtusis crassiusculis intus copiose papillosis; *antheris* lobis versus basin insertis oblongis apice obtusis necnon paullulum incurvis fere 1·5 mm. long.; *ovario* oblongo-ovoideo glabro 1·75 × 1·25 mm.; *stigmate* magno pileato-capitato sulcato copiose papilloso 1·5 mm. diam.

Mountains north of Ngoyé; on serpentine. 2065. Very distinct from all its New Caledonian congeners by reason of the large leaves and flowers.

Tapeinosperma nectandroides Mez (ex descript.). Mt. Canala; forest; 800 ft.; schists. 1166. Tree. Panicle with whitish branches. Flowers purple. The panicle is about 25 × 25 cm.; its branches and branchlets are stout and very patent.

T. Schlechteri Mez. Ignambi; forest; 2000 ft.; gneiss. 1487. Small tree, branching, with crowns of leaves. Stone fruit very dark purplish black when ripe. No flowering specimen being to hand, some doubt must attach to this identification.

SAPOTACEÆ.

Chrysophyllum gordoniæfolium S. Moore, sp. nov. *Arbor* circiter 9-metralis; *ramis* patulis cortice griseo longitrorsum rimoso lenticellifero cinctis; *foliis* 14–17 × 4–6 cm. petiolatis (pet. ± 2 cm. long.) anguste ellipticis obtusis basi cuneatis margine undulatis vel undulato-dentatis coriaceis glabris costis lateralibus utrinque 11–13 intervallis ± 1 cm. interjectis pag. sup. planis pag. inf. prominentibus; *floribus* pedicellatis in fasciculos sessiles paucifloros inter folia sitis vel ex caule jam foliis orbo oriundos digestis; *pedicellis* 5–6 mm. long. albo-furfuraceis; *calycis* 3 mm. long. ultra medium partiti puberuli segmentis 5 suborbicularibus obtusissimis æstivatione quincuncialibus; *corollæ* albæ 6–8-lobæ tubo 2·5 mm. long. lobis 4 mm. long. ovato-oblongis obtusis cito reflexis; *staminibus* corollæ faucibus affixis filamentis 4 mm. long. crassiusculis quam antheræ ovatæ plane longioribus; *ovario* 2·5 mm. long. ovoideo minute puberulo 5–6-loculari in stylum 1·5 mm. long. desinente.

Paompai; forest; 100 ft. 1862.

This very distinct species is peculiar in having the corolla and andrœcium not quite isomerous with the calyx. Baillon (Bull. Soc. Linn. Paris, ii. 899) notes this also of a species he calls *C.* ? *pyriforme*, which, however, from the description he gives, certainly differs in foliage as well as in flower from the plant under notice.

CHRYSOPHYLLUM FLORIBUNDUM S. Moore, sp. nov. *Frutex*? ramosus ramulis glabris cortice cinereo circumdatis innovationibus sericeo-ferrugineis; *foliis* 6·5–10 × 2·7–3·7 cm. obovato-oblongis obtusissimus basi in petiolum brevem gradatim angustatis coriaceis supra glabris subtus dense appresseque ferrugineo-tomentosis costis lateralibus utrinque ±20 satis approximatis pag. sup. mediocriter aspectabilibus pag. inf. plus minus obscuris; *florum* fasciculis axillaribus (sæpe ex nodo foliorum delapsorum erumpentibus) sessilibus paucifloris; *pedicellis* circa 3 mm. long. ferrugineis; *calycis* ferruginei 2 mm. long. segmentis 5 oblongo-ovatis obtusissimis concavis; *corollæ* 5-meræ tubo calyce breviore 1 mm. long. lobis erectis postea ascendentibus patentibusve ovato-oblongis obtusis margine membranaceis dorso minute ferrugineo-pubescentibus crassiusculis 2 mm. long.; *staminibus* corollæ basi segmentis affixis filamentis subulatis 1·25 mm. long. antheras ovoideas acutas excedentibus; *ovario* 1·25 × 1·5 mm. subgloboso villoso in stylum brevem deorsum villosum sursum glabrum 1 mm. long. exeunte.

No note of locality. No number.

Affinity with *C. leptocladum* Baill., but different in foliage among other features.

C. COMPTONII S. Moore, sp. nov. *Arbor*; *folio* unico solummodo viso magno (34 × 12 cm.) petiolato oblongo-obovato apice rotundato ipso retuso basi late cuneato margine undulato coriaceo supra glabro subtus minute appresse griseo-tomentoso costis lateralibus utrinque ultra 20 supra planis subtus eminentibus; *florum* fasciculis ±12-floris pedunculis crassis pulvinatis parvibracteatis ex caule ipso genitis insidentibus; *pedicellis* 7–8 mm. long. calycem multo excedentibus sicut calyx griseo-pubescentibus; *calycis* ultra medium partiti 3·5 mm. long. segmentis late ovatis obtusissimus; *corollæ* albæ vix usque medium divisæ tubo 3·5 mm. long. lobis oblongis obtusissimis retusisve reflexis; *staminibus* exsertis filamentis ima basi loborum corollæ insertis 3 mm. long. antheris 1·5 mm.; *ovario* 5-loculari ovoideo-oblongo striato fere glabro 1·5 mm. long. stylo quam sese tenuiore duploque longiore terminato.

Mt. Mou; damp stream-gully; 600 ft.; cretaceous. 550.

CHRYSOPHYLLUM PENINSULARE S. Moore, sp. nov. *Frutex* fere orgyalis; *ramis* glabris cortice cinereo tectis novellis subtilissime cinereo-pubescentibus; *foliis* 6·5–8·5 × 1·8–2·3 cm. oblongo-obovatis obtusissimis basi in petiolum 5–7 mm. long. gradatim desinentibus coriaceis supra glabris subnitidisque subtus rufo-tomentosis cito glabrescentibus costa media subtus valde prominente costis lateralibus utrinque ultra 12 obscuris nisi mediocriter perspicuis; *florum* fasciculis cauli jam foliis orbo insidentibus sessilibus paucifloris; *pedicellis* circa 1·5 mm. long. sicut calyx ferrugineis; *calycis* 1·5 mm. long. segmentis ovatis obtusis quam corollæ tubus paullo brevioribus; *corollæ* albæ 4-meræ fere 5 mm. long. lobis tubum semiæquantibus ovatis retusis recurvis glabris; *staminibus* exsertis corollæ faucibus affixis filamentis 2 mm. long. quam antheræ plane longioribus; *ovario* 4-loculari 1 × ·6 mm. ovoideo sericeo in stylum brevem crassum glabrum extenuato.

Presqu'île Bogota; occasional in serpentine scrub; 1500 ft. 1340.

This is close to *C. parvifolium* Schlechter, a species of which I have seen only material with flowers in very early bud. The leaves of Mr. Compton's plant are relatively longer and narrower than those of the other and ferrugineous when very young, its flowers are always borne on the stem after the leaves have fallen, the pedicels are shorter and the calyx is broader, this indicating a difference in the expanded flowers.

LUCUNA BAILLONII Zahlbr. Riv. Comboui; riverside and creekside rocks; above 300 ft.; serpentine. 2208.

PLANCHONELLA SERPENTINA S. Moore, sp. nov. *Frutex* vel arbuscula; *ramis* saltem superne bene foliosis satis validis cortice cinereo circumdatis; *foliis* plerisque 9–12 × 3·5–5 cm. obovatis vel obovato-oblongis apice late rotundatis sæpe emarginatis basi in petiolum 2 cm. long. desinentibus margine incrassatis leviterque revolutis crasse coriaceis supra fere glabris subtus primo tomento arcto furfuraceo ferrugineo indutis deinde subtilissime albo-sericeis costa media subtus prominente costis lateralibus utrinque 8–10 subtus optime eminentibus; *florum* fasciculis axillaribus paucifloris; *pedicellis* 2 mm. long. quam flores brevioribus incrassatis ut calyx furfure arcto ferrugineo præditis; *calycis* segmentis 5 4 × 3 mm. ovatis obtusis interioribus margine membranaceis; *corollæ* albo-viridulæ campanulatæ calyci æquilongæ medium usque divisæ lobis late rotundatis margine ciliolatis; *staminibus* inclusis corollæ faucibus insertis filamentis fere 1 mm. long. quam antheræ oblongo-ovoideæ acutæ duplo longioribus staminodiis ori affixis oblongis vel lanceolatis acutis obtusisve 1 mm. long.; *ovario* subgloboso albo-sericeo 1 mm. long. in stylum brevem conoideum glabrum stigmate parvo obscurissime lobulato terminatum desinente.

Comboui; serpentine scrub and scrubby wood; 2500 ft. 2183.

P. Wakere Pierre, to which this is evidently allied, has larger leaves with much longer petioles, longer pedicels to the flowers, corolla suddenly expanded at the limb, and a different ovary and style.

PLANCHONELLA SALIGNA S. Moore, sp. nov. Planta fruticosa trimetralis, erecta; *ramis* subteretibus saltem superne crebro foliosis cortice griseo obductis primo minute pubescentibus mox glabrescentibus; *foliis* 10 × 1–1·2 cm. alternis sat approximatis lineari-lanceolatis obtuse mucronatis basi in petiolum latum 5 mm. long. extenuatis coriaceis glabris; *floribus* in axillis solitariis pedicello brevi insidentibus; *calycis* segmentis 5 valde imbricatis, 4–4·5 × 2–2·5 mm. ovato-oblongis obtusis exterioribus (uti pedicelli) dorso pilis ferrugineis copiose præditis interioribus minoribus necnon glabris; *corolla* lactea calyce paullulum breviori extus glabra tubo 1·5 mm. long. lobis tubo æquilongis orbicularibus æstivatione valde imbricatis; *staminibus* tubo paullulum infra os staminodiis quam stamina paullo altius insertis his linguæformibus crassiusculis filamentis ·75 mm. long. antheris haud visis; *ovario* basi villoso 5-loculari ut stylus 2 mm. long.; *stylo* crassiusculo glabro; *ovulo* apicem versus loculi affixo.

Mont Panié; among rocks by cascade; 1200 ft. 1826.

The glabrous willow-like leaves with the shortly pedicelled axillary flowers serve to distinguish this on sight.

PALAQUIUM NEOCALEDONICUM S. Moore, sp. nov. *Arbor* 9-metralis late ramosa ramis apicem versus foliosis cortice cinereo obductis; *foliis* 9–10 × 3–4 cm. breviter petiolatis oblongis obtusis basi rotundatis margine cartilagineis coriaceis utrobique glabris costa media subtus eminente costis lateralibus utrinque circa 12 interjectis aliis valoris minoris omnibus sicut rete sublaxum mediocriter aspectabilibus; *floribus* pedicellatis in fasciculos 5–8-floros sessiles approximatos ex axillis foliorum mortuorum oriundos digestis; *pedicellis* circa 7 mm. long. flores pansos vix æquantibus sicut calyx subtiliter ferrugineo-sericeis; *calycis* fere 5 mm. long. segmentis 5 late ovatis apice rotundatis crassiusculis; *corollæ* sordide albæ tubo calyce paullo breviore glabro lobis 5 mm. long. ovatis obtusis cito patentibus; *staminibus* 10 corollæ ori affixis filamentis 6 mm. long. exsertis crassiusculis glabris quam antheræ sagittatæ manifeste longioribus; *ovario* dense villoso 5-loculari 2 mm. long. stylo conoideo glabro 3 mm. long. coronato.

Ignambi; on gneiss in forest; 3500 ft. 1521.

Baillon's genus *Achradotypus* should apparently be merged in *Palaquium*, otherwise the genus, which from India extends over the Malay Archipelago and on to Samoa, has hitherto had no New Caledonian representative.

* TROPALANTHE, *Sapotacearum*, genus novum.

Calycis segmenta 5, biseriata, suborbiculata, æstivatione valde imbricata. *Corolla* late campanulata, ultra medium divisa, lobis 6–8 inter se sæpe aliquantulum inæqualibus, imbricatis. *Stamina* 12–18, corollæ ore inserta; filamenta exserta; antheræ lanceolatæ, apice obscure mucronulatæ, extrorsum dehiscentes. *Staminodia* 0. *Ovarium* compressum, basi villosum, 6–8-loculare; stylus crassiusculus, inclusus; stigma punctiforme. *Ovula* juxta medium loculi affixa.—*Arbor*, valide ramosa. *Folia* magna, petiolata, coriacea. *Flores* pro rata magni, fasciculati, ex nodis foliorum jam delapsorum emissi, pedicellati.

SPECIERUM CLAVIS.

Folia pergamacea longit. 20 cm. excedentia. Pedicelli summum 1 cm. long. Ovarium glabrum................ .. *T. Sealyæ.*
Folia coriacea 20 cm. vix excedentia. Pedicelli 1·5 cm. long. Ovarium basi villosum .... *T. Comptonii.*

T. SEALYÆ S. Moore, sp. nov. (Pl. **21.** figs. 1–7.) *Arbor* ultra 20-metralis, *foliis* 24–30 × 10–13·5 cm. obovatis vel late obovato-oblongis apice breviter cuspidatis ipso obtusis basi in petiolum validum 4–5·5 cm. long. cuneatim angustatis margine undulatis pergamaceis supra glabris subtus primo pube ferruginea verisimiliter vestitis deinde fere glabris costis lateralibus utrinque ultra 20 marginem versus arcuatis; *fasciculis* pauci- (vix ultra 4-) floris; *pedicellis* circa 8 mm. long. segmentis suborbicularibus quam corollæ tubus paullulum brevioribus; *corollæ* roseæ lobis 6–8 late oblongis obtusissimis tubo paullo longioribus; *staminibus* 12–18 filamentis 8 mm. long. lineari-subulatis antheras oblongas basi mucronatas duplo excedentibus; *ovario* 4 mm. long. ovoideo glabro 6–8-loculari in stylum brevem glabrum extenuato.

Mt. Arago; fairly often in moist forest; 1500 ft.; mica schist. 1407. Mt. Panié; moist forest; 1500 ft.; gneiss. 1789. Trunk erect, bearing a crown of leaves.

The species is named in compliment to Mrs. R. H. Compton (*née* Sealy), who has rendered valuable assistance to Prof. Compton in arranging his collections.

T. COMPTONII S. Moore, sp. nov. *Arbor* circa 15-metralis, *foliis* oblongo-obovatis obtusissimis basi obtusis margine leviter undulatis coriaceis juvenilibus supra puberulis subtus minute ferrugineis vetustioribus utrobique glabris vel fere glabris 19–21·5 × 8 cm. costis lateralibus utrinque circa 18 marginem versus arcuatis petiolis 5–6 cm. long.; *fasciculis* summum 4-floris; *pedicellis* 1·5 cm. long. ut calyx minute arcteque ferrugineo-tomentosis; *calycis* in toto 10 mm. long. segmentis suborbicularibus margine

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* Gr. τροπαλίς, *i. e.* fasciculus.

membranaceis 8 mm. long.; *corollæ* albæ lobis 7–8 anguste obovato-oblongis obtusissimis 10 mm. long. tubum duplo excedentibus; *staminibus* 15 filamentis 13 mm. long. subulatis quam antheræ oblongæ triplo longioribus; *ovario* subgloboso basi villoso 7-loculari 4 × 5 mm. stylo filiformi glabro 6·5 mm. long. terminato.

Ignambi; fairly frequent in forest; 2000–3000 ft.; gneiss. 1522. Tree with spreading crown.

Pycnandra Benth., which these two plants resemble in general appearance and to which they are no doubt nearest allied, has corolla-lobes isomerous with the segments of the calyx and stamens at least five times as many as the lobes, and also more cells to the ovary.

EBENACEÆ.

By W. P. Hiern.

Maba buxifolia Pers., *var.* Cap Bocage; open scrubby association; 200 ft.; mica schist. 1400. Shrub 8 ft. Copious medium green leaves. Fruits acorn-like in 3-lobed calyx. From Tropical Africa through East Asia to North Australia.

Maba Vieillardi Hiern, *var.?* Comptoni Hiern, var. nov., foliis subtus subpallidioribus et fructibus minoribus (sc. modo 8 × 7 mm.). Cap Bocage; frequent in slightly sheltered parts of serpentine scrub and scrubby woods; 800 ft. 1399. Shrub 6 ft. Leaves stiff, light green. Fruits spherical in persistent 3-lobed calyx.

There being no flowers known of this plant, its status in the genus must at present remain doubtful.

M. fasciculosa F. Muell. Littoral, in *Acacia spirorbis* woods. 49, 778. Tree, drooping leaves. Ripe fruits green-brown. Calyx of 3 fleshy segments. The fruits of No. 778 are considerably larger than those of No. 49. Eastern Australia.

SYMPLOCACEÆ.

Symplocos (§ Bobua) calophylloides S. Moore, sp. nov. *Arbor* elata, *ramulis* ultimis foliosis primo angulatis dein subteretibus sparsim puberulis cito glabris; *foliis* 6–8 × 4–4·5 cm. petiolatis (pet. 1–2 cm. long.) obovato-oblongis apice rotundatis ipso sæpe retusis basi obtusis integris coriaceis glabris; *racemis* 4–5 cm. long. simplicibus foliis plane brevioribus plurifloris puberulis; *pedicellis* validis quam calyx brevioribus; *bracteis* ovato-oblongis vel ovatis obtusis acutisve circa 3 mm. long.; *calycis* 5 mm. long. extus puberuli bracteas nullo negotio superantis lobis tubo æquilongis suborbicularibus margine ciliatis; *corollæ* albæ alte divisæ in toto 6 mm. long. segmentis ovatis obtusissimis glabris; *staminibus* circa 60 filamentis 6 mm.

antheris ·75 mm. long.; *ovario* pæne omnino infero 3-loculari; *stylo* filamentis paullo breviore glabro.

Mt. Canala; forest; 200–300 ft.; mica schist. 1154. Tree often 80–100 ft.

Near *S. rotundifolia* Brongn., but with different leaves, considerably larger flowers subtended by bigger bracts, and corolla relatively shorter in comparison with the calyx. The broader ovary, moreover, suggests a difference in the shape of the fruit.

For S. MUNDA, sp. nov., see p. 415.

OLEACEÆ.

JASMINUM SIMPLICIFOLIUM Forst. Locality and number wanting. Australia and Polynesia.

J. DIDYMUM Forst. Mt. Mou; gully forest; 1500 ft.; serpentine. 455. Liane flowering about 25 ft. up. Corolla white, strong scent. Australia, Polynesia.

OSMANTHUS BADULA Hutchins. MS. in herb. Kew. (*Notelæa Badula* Vieill.) Plaine des Lacs; edge of flood plain; 600 ft.; serpentine. 382. Riv. Dumbéa; flood plain; 100 ft.; serpentine. 413. Riv. Ngoyé; riverside association; 300 ft. 2049. Shrub 4–8 ft., much branched, branches often lying on the ground. Flowers globular, scentless. Corolla white. No. 962 from Ngoyé (among stones in river-bed, serpentine, 200 ft.) would seem to be a narrow-leaved form of this species.

O. VACCINIOIDES Hochreut. (*Notelæa vaccinioides* Schlechter.) Nekando; serpentine scrub; 2000 ft. 2128. Shrub 4 ft. Leaves stiff, hard, light green. Flowers white, scentless. No. 188 would seem to be this in fruit—Baie Kuakué; serpentine scrub; 300 ft. Fruit ovoid, 7×4 mm.

APOCYNACEÆ.

MELODINUS BALANSÆ Baill. Riv. Dumbéa; scrubby woods above stream; 200 ft.; serpentine. 815. Low woody climber. White latex. Leaves dark green above, light below. Corolla white.

M. PHILLIRÆOIDES Labill. Ignambi; creekside forest; 1500 ft.; gneiss. 1666. Liane. White latex. Corolla white, with lobed pink corona at throat.

M. PAUCIVENOSUS S. Moore, sp. nov. Scandens, glaber; *ramulis* rigidis crebro foliosis subteretibus; *foliis* 5–7·5 × 2·5–4·5 cm. brevipetiolatis ovatis vel ovato-oblongis obtusis nisi obtusissimis basi rotundatis crasse coriaceis supra nitidis subtus opacis costis lateralibus comparate paucis (utrinque circa 8); *cymis* terminalibus vel ex axillis foliorum summorum oriundis

pedunculatis (ped. 1–2 cm. long.) foliis brevioribus plurifloris; *bracteis* late deltoideis ultimis calycis basin appropinquantibus 1 mm. long.; *calycis* 2 mm. long. segmentis deltoideis obtusis tubo circa æquilongis; *corollæ* albæ tubo superne levissime ampliato 6 mm. long. faucibus 10-squamatis (squamis antipetalis 0 vel minime aspectabilibus) lobis late obovatis tubo æquilongis; *staminibus* basin versus tubo insertis antheris lanceolatis obtusiusculis circa 1 mm. long.; *ovario* 1–25 mm. long. late ovoideo stylo 1·5 mm. long. coronato stigmate elevato-pileiformi apice breviter bifido ·7 mm. long.

Riv. Ngoyé; scrubby *Casuarina* association by riverside; 400 ft.; serpentine. 2107. This can be distinguished on sight from *M. phillirœoides* Labill. by its broader leaves with few lateral nerves. In nervature of the foliage it is more like *M. Balansæ* Baill., but this has larger flowers different in several respects.

MELODINUS CITRICARPUS S. Moore, sp. nov. Scandens; *ramulis* patentibus foliosis prominenter longitrorsum sulcatis glabris; *foliis* 6–13 × 3–4 cm. subsessilibus oblongo-lanceolatis obtusis basi rotundatis vel brevissime cordatis et tunc levissime amplexicaulibus supra lucidis subtus opacis coriaceis glabris costis lateralibus utrinque 10–12 pag. sup. eminentibus; *cymis* sæpissime terminalibus 2–3 cm. long. plurifloris ut pedicelli bracteæ calyx corollæque tubus subtiliter pubescentibus; *pedicellis* circa 2 mm. long.; *bracteis* 1–2 mm. long. ultimis calyci approximatis; *calycis* 3 mm. long. segmentis suborbicularibus tubo æquilongis; *corollæ* albæ tubo calycem duplo excedente a basi gradatim amplificato intus ad mediam partem puberulo faucibus squamis 10 lobulatis onustis lobis suborbicularibus tubum semiæquantibus; *staminibus* infra medium tubum insertis antheris lanceolatis obtusis 1·5 mm. long.; *ovario* 1·5 mm. long. ovoideo glabro stylo glabro paullo breviore terminato stigmate ovoideo bifido; *bacca* (fide cl. detectoris) sphæroidea *citri aurantii* magnitudine.

Mouac islet; 2356. A woody liane. With much the appearance of *M. scandens* Forst. this has larger flowers with a differently shaped tube and more prominent lobes, larger anthers, and a larger ovoid (not subsphæroidal) ovary.

RAUWOLFIA SEMPERFLORENS Schlechter. Riv. Dumbéa; common in flood plain; 100 ft.; serpentine. 418. Mt. Dore; stream-valley woods; 200 ft.; serpentine. 694. Riv. Ngoyé; riverside forest margin; 400 ft.; serpentine. 2051. Shrub 3–10 ft. Corolla white, sweet-scented.

R. SUAVEOLENS S. Moore, sp. nov. *Frutex* glaber vel *arbuscula*; *ramulis* sat validis subteretibus striatis; *foliis* 12–17 × 34 cm. pro verticillo usque 4 oblanceolatis obtusis basi in petiolum 1–3 cm. long. gradatim extenuatis coriaceis costa media supra subplana subtus eminente costis lateralibus pluribus difficile aspectabilibus; *cymis* 5–6×3–5 cm. verticillatis pedunculatis (ped. 3–5 cm.) foliis brevioribus cymulis plurifloris quam pedunculi brevioribus; *pedicellis* crassiusculis calycem sæpius paullo excedentibus; *calycis* 2 mm. long. segmentis ovato-oblongis obtusis tubo longioribus; *corollæ* albæ tubo cylindraceo extus glabro intus præsertim in ore villoso 4 mm. long. quam lobi rotundati haud breviore; *staminibus* juxta medium tubum insertis antheris ovato-oblongis acutis 1·25 mm. long.; *disco* cupulari ovario fere æquilongo; *ovarii* 1 mm. long. carpellis alte connatis ovatis compressis stylo brevi coronatis; *stigmate* submitriformi stylo longiore.

Mt. Arago; infrequent in moist forest; 1000 ft.; mica schist. 1416. Ignambi; fairly frequent in forest margin; 2000 ft.; gneiss. 1478. Mt. Panié; forest; 1500 ft.; gneiss. 1806. Shrub or small tree, 12 ft. Except for its larger obtuse leaves this has much the appearance of *R. amsoniæfolia* A. DC., but the flowers of the two are diverse in several respects.

ALYXIA LEUCOGYNE V. Heurck & Müll. Arg. Mt. Mou; edge of forest; 2000 ft. 619. Tree 25 ft. Flowers white; white latex.

A. SUAVIS Schlechter. Comboui Mts.; serpentine scrub above 3000 ft. 2177. Small shrub, 4 ft., branches stiff, erect. Leaves light green, hard but brittle. Petals strongly reflexed, white, sweet-scented.

A. NUMMULARIA S. Moore, sp. nov. *Frutex* ramosus; *ramulis* tenuibus inferne noduloso-cicatriciferis superne crebro foliosis primo puberulis cito glabris; *foliis* parvis usque 15×17 mm. subsessilibus ternatim verticillatis suborbicularibus apice retusis margine cartilagineis coriaceis pag. sup. glabris necnon pallide lucidis pag. inf. microscopice pubescentibus; *floribus* geminis (anne semper?) pedicellis calycem breviter excedentibus fultis; *calycis* 1 mm. long. ultra medium divisi segmentis late subulatis acutis; *drupa* 7–8×6 mm. simplici vel moniliformi et biarticulata articulis ovoideis terminali stylo persistente fusco indurato onusto microscopice furfuraceis.

Mt. Dore; occasional in serpentine scrub; 1500 ft. 841. Shrub 5 ft. The flowers are not known, but the remarkable foliage seems to justify description.

A. JOHNSONIÆ S. Moore, sp. nov. *Frutex* glaber fere biorgyalis; *ramulis* gracilibus cito albescentibus ultimis foliosis; *foliis* 5–7×2·5–3·5 cm. oppositis ternisve petiolatis (pet. circa 5 mm. long.) ovatis vel ovato-oblongis apice cuspidato-attenuatis ipso obtuse acutis basi obtusis pergamaceis costis lateralibus utrinque ultra 20 tenuibus; *cymis* axillaribus abbreviatis paucifloris in toto circa 1 cm. long.; *pedicellis* calyci circa æquilongis; *calycis* 2 mm. long. segmentis ovatis obtusis tubo longioribus; *corollæ* tubo 5·5 mm. long. superne levissime amplificato extus glabro intus ore necnon juxta

medium piloso lobis late ovatis obtusissimis 3 mm. long.; *staminibus* supra medium tubum insertis antheris lineari-lanceolatis acuminatis 1 mm. long.; *ovario* ovoideo sericeo stylum longiorem (2 mm. long.) glabrum fulciente; *stigmate* capitellato; *bacca* moniliformi e segmentis 3 ellipsoideis optime sulcatis sistentibus in toto 5 cm. long. segmentis ±15×8 mm. intervallis 2–2·5 mm. long. sejunctis.

Mt. Mou; moist gully; 600 ft.; cretaceous. 543. Shrub 5 ft. Corolla white with yellowish tube.

The inflorescence in several respects is like that of *A. brevipes* Schlechter, but the foliage of the two is diverse. According to the description *A. Loesneriana* Schlechter has coriaceous leaves and larger flowers dissimilar in some points. The only flower examined shows no signs of moniliformity in its ovary. The berry would hence appear to be sometimes undivided.

ALYXIA SERPENTINA S. Moore, sp. nov. *Fruticulus* pauciramosus, glaber; *ramis* sat validis superne copiose foliosis inferne foliorum mortuorum cicatricibus signatis; *foliis* ±4 cm.×3–6 mm. plus minus patentibus vulgo 4-natim verticillatis breviter petiolatis anguste oblongo-lanceolatis obtusis margine revolutis coriaceis nitentibus; *cymis* 2×2 cm. pseudoterminalibus pedunculatis plurifloris; *bracteis* ovatis ·5 mm. long. quam pedicelli crassiusculi manifeste brevioribus; *calycis* pedicello brevioris segmentis 1·5 mm. long. triangularibus acutis; *corollæ* tubo 2·5 mm. long. ex calyce breviter eminente late subcylindrico ore pilis recurvis onusto lobis suborbicularibus tubo æquilongis; *staminibus* medio tubo insertis antheris subsagittatis apiculatis circa 1 mm. long.; *ovario* late ovoideo 1·2 mm. long. stigmate sessili bifido ·5 mm long. coronato.

Taom; serpentine scrub; 2500 ft.; uncommon. 2337. Shrub 2 ft. Corolla white, sweet-scented. In shape of leaf this is somewhat like *A. disphærocarpa* v. Heurck & Müll. Arg., but in other respects very diverse.

The following specimens referable to the genus are specifically indeterminable:—

1. A. sp. (Apparently conspecific with Vieillard 2969 and Deplanche 205.) Port Déspointes; woods. 137. Small shrub, 4 ft. The specimens are flowerless. Berries very small, torulose.

2. A. CLUSIOPHYLLA Guillaum.? (*Gynopogon clusiophyllum* Baill.?) Mt. Mou. 625. Agrees with the description as to foliage. Baillon does not describe the fruit which is simple or moniliform, the drupes narrowly ovoid, longitudinally sulcate and transversely rugose, and 15×7 mm. There are no flowers.

3. ALYXIA, sp. nov.? Plaine des Lacs; *Dacrydium* association; 800 ft. 319. Weak shrub, 5 ft. Leaves ternate, ±5×1 cm., strongly shining above. Fruits moniliform, the portions ovoid, 9×4 mm. Nothing like this has come under notice, either by specimen or by description. Flowers are wanting.

4. A. sp. nov.? Mt. Humboldt; forest by stream; 1000 ft.; serpentine. 1035. Leaves ternate, oblanceolate-obovate, coriaceous, about 6×3 cm. Berries torulose, the segments 14–18×8–9 mm. Foliage rather like that of *A. obovatum* Schlechter. Flowers wanting.

CERBERA ODOLLAM Gaertn. Port Ngéa; Nouméa. 6, 8. Taom; streamside association; 200 ft.; serpentine. 2287. East Indies to Australia and Polynesia.

PTEROCHROSIA COMPTONII S. Moore, sp. nov. (Pl. **22**. figs. 1–6.) *Frutex* suborgyalis, fere glaber; *ramis* bene foliosis subteretibus levibus; *foliis* 9–10×3–4 cm. petiolatis (pet. 1·5 cm. long.) anguste obovato-oblongis obtusis vel obtusissimis basi cuneatim angustatis supra levissime nitidis subtus opacis; *corymbis* 8–11×5–6 cm. sublaxis plurifloris foliis subæquilongis; *bracteis* ovatis acutis mox deciduis ±10×5 mm.; *pedicellis* gracilibus plerumque 12–15 mm. long.; *calycis* segmentis quam corollæ tubus manifeste brevioribus ovatis vel lanceolato-oblongis obtusis vel obtuse acutis inter se inæqualibus 5·5–6×3 mm.; *corollæ* tubi 13 mm. long. parte amplificata quam pars cylindrica ter longiore lobis tubo circa æquilongis oblongo-obovatis apice truncatis margine denticulatis; *staminibus* infra medium tubum insertis antheris oblongo-ovatis apiculatis 2 mm. long.; *carpellis* glabris 1×1·25 mm. stylum longiorem (fere 6 mm. long.) fulcientibus; *samara* oblonga apice rotundata ipso mucronata glabra calyce persistente stipata 3·2–3·4×1·5–1·7 cm.

Taom; riverside among pebbles; 300 ft.; serpentine. 2323. Shrub 5 ft. with copious white latex. Corolla white with yellow throat surrounded by purple marking, sweet-scented. Differs from *P. Vieillardi* Baill. (Pl. **22**. fig. 7) in several points, notably the inflorescence and the oblong samaras.

P. NERIIFOLIA S. Moore, sp. nov. *Arbuscula*; *ramulis* crebro foliosis robustis striatulis subtiliter griseo-pubescentibus; *foliis* 8–12×2·5–4 cm. oblongo-oblanceolatis obtusis vel obtusissimis basin versus in petiolum 1–3 cm. long. angustatis utrinque leviter nitidis glabris; *corymbis* fastigiatis 14×12 cm. multifloris pubescentibus; *bracteis* albis ±8×5 mm. ovatis obtusis puberulis diutule persistentibus; *pedicellis* satis validis circa 1 cm. long. pubescentibus; *calycis* albi segmentis 7–8×3–5 mm. obovatis vel obovato-oblongis obtusissimis puberulis; *corollæ* tubi 9 mm. long. parte amplificata parti cylindricæ æquilonga lobis obovatis obtusissimis 6·5 mm.

long.; *staminibus* supra medium tubum insertis antheris ovatis apiculatis 1 mm. long.; *carpellis* glabris 1×·75 mm.; *stylo* in toto 6·5 mm. long.

Among rocks of Riv. Comboui; 400 ft.; serpentine. 2168. Tree 25 ft.; rough dark bark; copious white latex becoming sticky at once. Corolla pinkish white, sweet-scented. Fruit not seen, but, judging from the carpels, very like that of *P. Comptonii*. No. 900 from Kuakué edge of forest by riverside, 100 ft.; serpentine, should be referred here. It is a shrub 4 ft. high with erect stem. Leaves somewhat more shining than those of *P. Comptonii*. Corolla white, tinged magenta, sweet-scented. This is apparently a state of the plant flowering before attaining its full stature.

Baillon in a short diagnosis of *Pterochrosia* (Hist. des Plantes, x. p. 194) says there is no difference as regards the flowers between it and *Cerbera*, *Pterochrosia* being characterized by its samaroid as distinguished from *Cerbera*'s drupaceous fruit. But he also says the corolla-lobes overlap to the right, whereas those of *Cerbera* (and of the two species here described) overlap to the left. In these circumstances, and seeing how the two statements are contradictory, we may assume that "dextrorsum" has been written inadvertently for "sinistrorsum" in Baillon's description. A formal diagnosis of the genus is appended herewith.

PTEROCHROSIA Baill., *Apocynacearum* e tribu *Plumeriearum* genus.

Calyx 5-partitus, intus eglandulosus. *Corolla* hypocrateriformis, tubo calycem excedente inferne cylindrico superne dilatato supra staminum insertionem squamis 5 pubescentibus onusto, faucibus haud vel vix contractis; limbo 5-lobo lobis sinistrorsum obtegentibus. *Stamina* supra vel infra medium tubum inserta; antheræ parvæ loculis basi inappendiculatis. *Ovarii* carpella 2, distincta; stylus filiformis, inferne sejunctus, superne in stigma crassum appendice prominente biloba onustum subito dilatatus; ovula quove in loculo 2. *Fructus* samaroideus, abortu unicus, oblongus vel vespertilioniformis, coriaceus, 1-spermus. *Semina* compressa, exalbuminosa, cotyledonibus carnosis.—Frutices vel arbusculæ. Folia alterna, casu opposita vel subopposita, crebro penninervia, coriacea. Flores mediocres prominenter bracteati, in paniculas vel corymbos ex racemis compositis constantes ordinati.

Generis species tres prima visu ita distinguendæ sunt:

§ *Euryptera.*
  Samara alis latis transversis prædita................. *P. Vieillardi.*
§ *Leptoptera.*
  Samara alis oblongis prædita—
    Inflorescentia sublaxa. Bracteæ mox deciduæ. Stamina infra medium tubum inserta ...... *P. Comptonii.*
    Inflorescentia fastigiata. Bracteæ diutule persistentes. Stamina supra medium tubum inserta .... *P. neriifolia.*

ALSTONIA VIEILLARDII V. Heurck & Müll. Arg. River Comboui; forest; 100 ft.; serpentine. 2010. Tree 25 ft. Branches of inflorescence purple-brown. Corolla bright yellow.

A. LANCEOLATA V. Heurck & Müll. Arg. Mt. Canala; transitional forest; 1500 ft.; frequent; mica schist. 1271. Ignambi; transitional forest; 2000 ft.; scarce; gneiss. 1719. Shrub or small tree. Corolla white, sweet-scented.

A. PLUMOSA Labill. Ignambi; forest; 2500 ft.; fairly frequent; gneiss. 1518. Tree 30 ft. Panicles drooping. Corolla creamy white, scentless.

A. LENORMANDI V. Heurck & Müll. Arg. Mt. Koghi; serpentine scrub; above 2000 ft.; frequent. 738. Shrub 4 ft. Corolla white, hairy at mouth, sweet-scented. The only specimen of this species seen (Vieillard, 919) is not very satisfactory, hence some doubt must attend the identification.

A. LANCEOLIFERA S. Moore, sp. nov. *Arbuscula* glabra; *ramulis* verticillatis subteretibus in nodis aliquantulum tumidis sursum foliosis; *foliis* ±10×2 cm. plerumque oppositis raro ternis vel subternis petiolatis (pet. 5 mm. long) oblongo-lanceolatis obtusis basi angustatis pergamaceis costa media supra impressa subtus prominente costis lateralibus utrinque 20 vel ultra subobscuris; *cymis* 6×6–8 cm. pseudoterminalibus foliis brevioribus pedunculatis ramosis laxe plurifloris; *pedicellis* calycem plane excedentibus; *calycis* 1·5 mm. long. segmentis late ovatis obtusissimis tubum circa æquantibus; *corollæ* glabræ tubo calycem paullo excedente cylindrico lobis dextrorsum obtegentibus suborbicularibus tubo circiter æquilongis; *staminibus* juxta medium tubum insertis antheris ovoideo-oblongis obtusis ·75 mm. long.; *ovario* fere 1 mm. long. late ovoideo in stylum breviorem desinente; *stigmate* elevato-pileiformi apice breviter bifido ·5 mm. long.

Mt. Koghi; margin of valley forest; 1000 ft.; serpentine. 766. Tree 25 ft. Flowers creamy-white. This has much the foliage of *A. lanceolata* V. Heurck & Müll. Arg., but different flowers.

A. CORIACEA Panch. MS. ex Guillaum. *Frutex* altus glaber, *ramulis* ultimis sat validis foliosis; *foliis* ±10×2 cm. oppositis oblongo-oblanceolatis obtusis basi in petiolum 1–2 cm. long. gradatim attenuatis coriaceis costis lateralibus utrinque ultra 20 pag. sup. nitida fere evanidis pag. inf. mediocriter perspicuis; *cymis* pseudoterminalibus circa 6×10 cm. pedunculatis ramosis laxe plurifloris; *pedicellis* 5 mm. long.; *calycis* 1·5 mm. long. fere usque basin divisi lobis late ovatis obtusis; *corollæ* tubo in medio aliquantulum dilatato 2·5 mm. long. lobos lanceolatos semiæquante; *antheris* juxta medium tubum insertis lanceolatis acutis ·8 mm. long; *ovario* ·5 mm.

long. ovoideo in stylum æquilongum desinente; *stigmate* ampullæformi apice breviter bifido ·25 mm. long.

Plaine des Lacs; damper parts of *Dacrydium* association; 800 ft. 314. Shrub 6 ft. Corolla greenish white.

The type of this is Vieillard 2956 to which is appended the note: "Arbrisseau de 3 mètres. Plaines ferrugineuses arides." No. 693, also referred here, has shorter inflorescences (4 cm. long). Mt. Dore; common in scrubby woods; 2000 ft.; serpentine.

ALSTONIA LEGOUXIÆ V. Heurck & Müll. Arg. Presqu'île Bogota, abundant in serpentine scrub; 0–1500 ft. 1324. Nekando; scrub at forest margin; serpentine. 2030. Shrub 4–6 ft. Corolla white with a pinkish-mauve tinge or a rosy streak on each lobe.

A. RETUSA S. Moore, sp. nov. *Frutex* ramosus, orgyalis, glaber; *ramulis* subteretibus aliquantulum nodosis sursum foliosis; *foliis* 3–4·5 × 1–2 cm. oppositis oblanceolatis vel oblanceolato-linearibus retusis basin versus in petiolum 5–8 mm. long. gradatim extenuatis coriaceis costa media supra insculpta subtus prominente costis lateralibus utrinque circa 10 tenuibus pag. sup. insculptis pag. inf. paullo eminentibus; *cymis* circa 4 × 2 cm. pseudo-terminalibus foliis circiter æquilongis pauciramosis paucifloris; *pedicellis* 4 mm. long. calyces facile excedentibus bracteatis crassiusculis; *calycis* 2 mm. long. segmentis rotundatis tubum circiter æquantibus; *corollæ* pallide luteæ tubo ex calyce plane eminente in medio constricto inferne superneque dilatato 6 mm. long. lobis dextrorsum obtegentibus oblongis obtusis tubum semi-æquantibus; *staminibus* tubo prope basin insertis antheris lanceolatis ·75 mm. long,; *ovario* 1 mm. long. subgloboso stylum breviorem fulciente; *stigmate* pileato apice bifido; *folliculis* linearibus tenuibus apice ipso paullulum attenuatis 7·5 cm. × 4–5 mm.

Poume: serpentine scrub; 500 ft. 2363. Shrub 6 ft. Branches erect, twiggy. The retuse leaves afford an easy means of recognising this species. The flowers are apt to become galled by puncture apparently of some insect.

A. DEPLANCHEI V. Heurck & Müll. Arg. Baie Kuakué; frequent in serpentine scrub; 500 ft. 883. Shrub 6 ft. Flowers white, scentless.

A. COMPTONII S. Moore, sp. nov. *Arbuscula* glabra; *ramulis* ultimis sat robustis compressis aliquantulum incrassatis; *foliis* 12–20 × 3–5 cm. oppositis decurrentibus oblongo-oblanceolatis obtusis vel obtusissimis basi in petiolum longum (sæpe 4–5 cm.) coartatis tenuiter coriaceis costa media pag. sup. insculpta pag. inf. prominente costis lateralibus numerosis (plerumque 30 vel etiam magis) tenuibus utrinque bene visibilibus; *cymis* pseudoterminalibus circa 10 × 12 cm. horum ramis gracilibus maxime divaricatis; *pedicellis* ±4 mm. long. calyce multo longioribus; *calyce* ultra medium diviso lobis

suborbicularibus vel late ovatis obtusisque 1 mm. long.; *corollæ* albæ tubo calycem breviter excedente (2·25 mm. long.) medio parum dilatato lobis oblongis obtusis 4 mm. long.; *staminibus* prope medium tubum insertis antheris lanceolatis obtusis ·75 mm. long.; *ovario* 1 mm. long. ovoideo in stylum brevem desinente; *stigmate* anguste pileiformi ·25 mm. long.

Kuakué; scrub-forest; 200 ft.; serpentine. 953. Small tree, 20 ft. The long narrow *Rauwolfia*-like leaves coupled with the very divaricate branching of the cymes affords an easy means of recognising this plant.

ALSTONIA SALIGNA S. Moore, sp. nov. *Frutex* glaber vel arbuscula; *ramulis* tenuibus fuscis superne foliosis; *foliis* 8–9 cm. × 6–8 mm. oppositis petiolatis (pet. 5–10 mm. long.) lineari-lanceolatis obtusis tenuiter coriaceis costa media pag. sup. insculpta pag. inf. eminente costis lateralibus numerosis parum aspectabilibus; *cymis* pseudoterminalibus 5 × 7 cm. laxe paucifloris; *floribus* parvis longipedicellatis pedicellis ± 6 mm. long.; *calyce* 1·25 mm. long. fere basin usque partito segmentis late ovatis obtusis; *corollæ* albæ tubo 2·25 mm. long. in medio aliquanto dilatato intus ore et prope staminum insertionem pubescente lobis dextrorsum obtegentibus oblongis obtusis 4 mm. long.; *antheris* juxta medium tubum insertis lanceolatis obtusis ·3 mm. long.; *ovario* fere 1 mm. long. ovoideo-oblongo in stylum paullo breviorem excurrente; *stigmate* inferne tumido superne capitato bifidoque ·3 mm. long.

Riv. Ngoyé; *Spermolepsis-Casuarina* forest; 500 ft.; serpentine. 1009. In the flowers this much resembles *A. Comptonii*, but its small narrow willow-like leaves are very distinct.

TABERNÆMONTANA CERIFERA Panch. & Sebert. Mt. Arago; streamside forest; 1000 ft.; schists. 1420. Tree. Flowers creamy white, twisted, with strong sweet scent. Copious white latex.

There is no specimen of this species in the country, and the description is very meagre, so that the determination must be regarded as provisional. Mr. Compton notes that the plant is "abundant in moist forests, sea-shore woods, etc." The old nomenclature has been used; in the new it would be an *Ervatamia*.

PARSONSIA CORYMBIFERA Baill. Mt. Mou; moist parts of Niaouli zone; 8000 ft.; cretaceous. 508. Flowers yellowish tinged with pink.

P. BRACHIATA Baill. Port Déspointes; woods. 227. I have been unable to trace a description under this name. Mr. Compton's plant is similar to Deplanche 72, cited by Guillaumin under *P. brachiata*. Flowers greenish white.

P. BALANSÆ Baill. Nekando; among rocks of streams; serpentine. 2018. Twining liane. Corolla spreading, white with a dull crimson blotch on the upper side of each petal, throat rich yellow, slightly scented. This is evidently conspecific with Balansa 209 (at Kew), which is Baillon's type. Schlechter's 15105, referred to this species, so far at least as concerns the specimens distributed under this number to the British Museum and to Kew, is obviously a different plant.

PARSONSIA COMPTONII S. Moore, sp. nov. Planta scandens, *ramis* bene foliosis subteretibus uti petioli foliorum pagina inf. nec non inflorescentiæ axis tomento fulvo subtilissimo obductis deinde glabrescentibus; *foliis* usque 7 × 3 cm. petiolatis cordatis acutis pergamaceis pag. sup. primo subtiliter pubescentibus mox glabrescentibus et saltem in sicco fuscescentibus petiolis circa 2 cm. long.; *cymis* sæpissime ramulos breves juveniles terminantibus 4–6 × 3–5 cm. patenti-ramosis multifloris; *pedicellis* validis calycem excedentibus; *calycis* vix 2 cm. long. medium usque divisi fulvo-tomentosi segmentis deltoideis obtusis; *corollæ* tubo 3 mm. long. suburceolari ut lobi extus subtilissime tomentoso lobis triangularibus acutis tubo æquilongis; *staminibus* prope basin corollæ affixis filamentis dense barbatis superne glabris 4 mm. long. antheris breviter exsertis lanceolato-sagittatis acutis 3 mm. long.; *disci* squamis oblongis obtuse acutis ovario circa æquilongis; *ovario* ovoideo superne setoso 1·25 mm. long.; *stylo* glabro 3 mm. long.; *stigmate* antherarum medium attingente vix 1 mm. long.

Poume; scrub and scrubby woods; 1200 ft. 2370. Liane keeping low among shrubs; corolla grey outside, deep red inside, scentless. Its indumentum and the rather small cordate leaves are good first-sight points for distinguishing this species.

P. VARIABILIS Baill. Baie Ngo; serpentine scrub; 200 ft.; frequent. 263. Plaine des Lacs; abundant on slight slope. 377, 377 *a*. River Comboui; lowland serpentine scrub; 500 ft. 2219. Low liane. Lower leaves linear, upper broader. Corolla white with a purple blotch on each petal, scentless. (The corolla of No. 263 is described as white, but it seems to be only a form of this variable species.)

P. EFFUSA S. Moore, sp. nov. *Caule* volubili ramulos foliatos glabros emittente; *foliis* 7–8 × 3·5–4 cm. petiolatis (pet. 1·5–2 cm. long.) anguste ovato-oblongis breviter acuminatis basi truncato-rotundatis membranceo-coriaceis ubique glabris costis lateralibus utrinque 10–12 subtus aspectabilioribus; *cymis* 12 × 20 cm. terminalibus ramosis effusis multifloris glabris; *pedicellis* gracilibus ±1 cm. long.; *calycis* glabri 3 mm. long. segmentis deltoideis obtusis tubo æquilongis; *corollæ* tubo 3·5 mm. long. cylindrico extus glabro intus ad fauces barbato quam lobi triangulares obtuse acuti paullulum breviore; *staminibus* prope basin tubo corollæ insertis filamentis complanatis inferne ciliatis antheris breviter exsertis lanceolato-sagittatis obtusis ambobus 3·5 mm. long.; *disci* squamis oblongis obtuse acutis ovarium

circa æquantibus; *ovario* 1·25 mm. long. compresso late ovoideo glabro; *stylo* superne leviter dilatato glabro vix 3·5 mm. long.; *stigmate* antherarum medium attingente 1·5 mm. long.

River Ngoyé; riverside scrubby *Casuarina* association; 400 ft.; serpentine. 2105. Corolla dull yellowish white. Differs from *P. Balansæ* Baill. *inter alia* in the texture of the somewhat differently shaped acuminate leaves, the very effuse cymes and much smaller corollas with narrow lobes. No. 352 from Plaine des Lacs appears to be a form of this with more acuminate leaves and smaller, comparatively few-flowered cymes.

PARSONSIA TAOMENSIS S. Moore, sp. nov. *Caule* scandente ramulos teretes subtiliter fulvo-tomentellos deinde glabrescentes gignente; *foliis* usque 5×2 cm. brevipetiolatis (pet. 3–6 mm. long.) oblongis vel anguste oblongo-ovatis apice rotundatis ipso subito brevissime attenuatis basi obtusis supra glabris pallideque lucidis subtus tomento minuto fulvo vel griseo obtectis costis lateralibus utrinque 4–6 facie utravis mediocriter aspectabilibus; *cymis* terminalibus abbreviatis (1·5×1·5 cm.) dense plurifloris; *pedicellis* calyce paullo brevioribus; *calyce* 2·25 mm. long. usque medium diviso ut pedicelli corollæque subtiliter tomentello lobis deltoideis acutis; *corollæ* 3·75 mm. long. tubo campanulato ore annulo pilorum onusto quam lobi triangulares acuti 2·25 mm. long. breviore; *staminibus* juxta basin corollæ insertis filamentis brevibus fere glabris antheris breviter exsertis lanceolato-sagittatis acutis 2 mm. long.; *disci* squamis oblongo-ovoideis obtusis; *ovario* subgloboso disci squamis circiter æquilongo ·75 mm. long.; *stylo* glabro 1 mm. long.; *stigmate* anguste claviformi antherarum medium superante ·75 mm. long.

Taom; serpentine scrub; 1500 ft. 2312. A low liane. Corolla green, without markings. *P. micans* Schlechter has foliage somewhat different in several respects, larger corollas (7 mm. long.) and filaments equal in length to the stamens.

Var. FUSCESCENS, var. nov. *Foliis* subtus puberulis siccitate fuscescentibus; *corollæ* tubo in ore pilis perpaucis prædito.

Taom; serpentine scrub; 1000 ft. 2311. A low liane. Flowers dull green with brown markings on inside of petals.

ASCLEPIADACEÆ.

ASCLEPIAS CURASSAVICA L. Tonghouè Mts. Weed of cultivation. 164. From the West Indies widely spread over warmer regions of the world.

SARCOSTEMMA AUSTRALE R. Br. Ouen Toro; littoral zone. 50. Île Ouéré; abundant in littoral zone; scrambling and twining among bushes. 642. Australia.

Gymnema sylvestre R. Br. Île Ouéré; littoral sand on hill. 640.
This is not in Guillaumin's list, but there is a specimen of Vieillard's in the British Museum (No. 950). India and Archipelago, tropical Australia.

Tylophora insulincola S. Moore, sp. nov. *Caule* volubili tereti distanter folioso subtiliter pubescente; *foliis* 3·5–4·5 × 1·5–2 cm. petiolatis (pet. ±1 cm. long.) ovato-oblongis obtusissimis apice ipso mucronatis basi obtusis subtenuiter crassiusculo-coriaceis supra mox glabris leviterque nitidis subtus costa media pubescente exempta puberulis; *cymis* plurifloris breviter pedunculatis 2–4 cm. long.; *pedicellis* longit. flores plane excedentibus uti pedunculi calycesque subtiliter pubescentibus; *calycis* 3 mm. long. alte partiti segmentis ovato-oblongis obtusis; *corollæ* rotatæ tubo 1 mm. long. lobis ovatis obtusis; facie utravis glabris 6·5 mm. long.; *coronæ* phyllis ·5 mm. long. ovatis obtusis superne a gynostegio liberis incrassatis fuscis; *antherarum* appendicibus parvis quadratis super stigma vix eminentibus; *polliniis* ·2 mm. long. ovoideis glandulæ subglobosæ conjunctis; *stigmate* vertice convexiusculo ·75 mm. diam.

Isle of Pines; roadside; coral-forest association; 100 ft. 2281. A low liane, right-handed twiner. Corolla pale yellow, sweet-scented.

T. biglandulosa F. Muell., from Norfolk Island, known to me only by description and figure, is a glabrous plant with larger leaves and considerably larger flowers. *T. tapeinogyne* Schlechter (New Caledonia) in its typical form is described as having puberulous stems, leaves and inflorescences, but its corollas have oblong lobes, the coronal leaves are oblong and the anther appendages overtop the depressed stigma. The three species are no doubt closely connected.

Marsdenia ericoides Schlechter. River Ngoyé; riverside and rocks in stream-course; 200 ft.; serpentine. 2133. Low shrub 1–2 ft. Pedicels and calyx brownish. Corolla white with spreading segments pink above, very sweet-scented. From same locality as Schlechter obtained his typical material.

M. assimulata S. Moore, sp. nov. *Caule* gracili scandente nisi volubile crebro subdistanterve folioso cito glabro; *foliis* 6–10 cm. × 1·5–3 mm. brevipetiolatis linearibus obtusis coriaceis glabris; *cymis* foliis multo brevioribus breviter pedunculatis plerisque 3–5-floris; *floribus* parvis pedicellis 2 mm. long. pedunculum æquantibus fultis; *calycis* 2 mm. long. alte partiti segmentis ovatis acutis glabris; *corollæ* parvulæ urceolaris tubo 3·5 mm. long. intus præsertim in faucibus pilis recurvis obsito lobis ovato-oblongis acutis crassiusculis 2 mm. long.; *coronæ* phyllis superne liberis lanceolatis acutis gynostegium leviter superantibus; *gynostegio* 1·5 mm. alt.; *antherarum* appendicibus lanceolatis acutis; *polliniis* ovoideis circa ·05 mm. long. glandulæ oblongæ conjunctis.

Plaine des Lacs; gentle serpentine slopes; 500 ft. Trailing, ascending among bushes. 337. Kuakué; river flood-plains; serpentine; 50 ft. 911. River Comboui; lowland scrub; 500 ft.; serpentine. 2224. The flowers are described as dull greenish, dull yellow and brown, and brownish outside, yellowish green inside, sweet-scented.

In foliage this is the counterpart of *M. Billardieri* Dcne. and *M. microstoma* Schlechter: of this latter there is no specimen in the London herbaria; it is described as having *inter alia* 8–15-flowered cymes, corollas with suborbicular very obtuse lobes, and a corona of broadly trapeziform leaves entirely adnate to the gynostege. *M. Billardieri*, also not available for examination except for Schlechter's specimens so named (Nos. 14892 and 15200), with what appear to be the flowers injured by insects, is said to have 1–3-flowered cymes, corollas with bundles of hairs in the throat and deltoid lingulate coronal leaves: moreover, the corollas of this species would seem to be considerably the larger.

HOYA NEOCALEDONICA Schlechter. Ermitage stream; forest; 500 ft.; serpentine. 199. Taom; frequent in creekside forest; 300 ft.; serpentine; 2340. Twining liane. Flowers waxy, white, purple centre, sweet-scented.

H. LIMONIACA S. Moore, sp. nov. Scandens fere ubique glabra; *caule* subtereti ad nodos tumido distanter folioso crassiusculo; *foliis* 7–8 × 3–3·5 cm. petiolatis (pet. usque 15 mm. long.) ovatis apicem versus attenuatis apice ipso obtusis basi rotundato-obtusis 5-nervibus crassiusculo-coriaceis; *umbellis* paucifloris pedunculatis; *pedunculo* 2·5 cm. long. subtereti sparsim pilosulo florum rhachi abbreviata subglabrata coronato; *pedicellis* filiformibus glabris 12–15 mm. long.; *calycis* 1·5 mm. long. extus papillosi segmentis ovatis obtusis glabris; *corollæ* pansæ 1 cm. diam. medium usque divisæ lobis ovatis obtuse acutis intus subtiliter papillosis; *coronæ* phyllis patentibus superne rhomboideo-ovatis utrinque acutis dorso late canaliculatis usque 4 mm. radiantibus; *antheris* trapezoideis appendice tenera ovato-lanceolata obtusa onustis; *polliniis* ·6 mm. long. oblongo-pyriformibus quam glandula ovata 4-plo longioribus.

Isle of Pines; abundant in coral forests; 50 ft. 2253. Liane. Corolla pale yellow, slightly scented. Differs from *H. neocaledonica* Schlechter chiefly in the subglobose (not cylindrical) flowering rhachis, and the short pedicels to the smaller pale yellow (not white) flowers.

To this species may perhaps belong a yellow-flowered *Hoya* of Pancher's collecting (*Pancher*, sine no. in Herb. Mus. Brit.). This is not noticed by Guillaumin, whose list contains only one species of the genus, viz. Schlechter's mentioned above.

LOGANIACEÆ.

GENIOSTOMA BALANSÆANUM Baill. Nekando; serpentine scrub; 300 ft. 2025. Small shrub under 3 ft. Flowers erect, corolla white, stamens white spreading outwards between petals.

GENIOSTOMA GLAUCESCENS Schlechter. Ignambi; fairly frequent in forest; 2500–3500 ft.; gneiss. 1517, 1852. Small tree, 20 ft. Corolla white, easily falling, scentless.

G. THYMELEACEUM Baill. Comboui Mts.; *Spermolepis-Agathis* forest by creek; serpentine; 100 ft. 2174. Small weak shrub, 3 ft. Flowers pendent. Calyx green. Corolla white, faintly scented.

G. LOPEZIÆFOLIUM S. Moore, sp. nov. *Frutex* elatus glaber; *ramulis* brevissime 4-alatis crebro foliosis; *foliis* ±4 × 1·5 cm. subsessilibus oblongo-lanceolatis lanceolatisve acutis nisi acuminatis basi sæpissime obscure cordatis integris membranaceis; *floribus* axillaribus solitariis; *pedunculis* usque 1·5 cm. long. filiformibus basin versus bracteolatis; *calyce* alte partito 3 mm. long. segmentis late ovatis obtusissimis margine microscopice ciliolatis; *corollæ* albæ late campanulatæ tubo quam calyx paullo longiore intus subtiliter puberulo lobis suborbicularibus tubum semiæquantibus; *staminibus* exsertis faucibus affixis filamentis 1 mm. long. quam antheræ parvæ apiculatæ paullulum longiores; *ovario* depresse globoso glabro 2 × 4 mm. quam stylus crassus longiore; *stigmate* didymo.

Tonine; forest; 2000–3000 ft. 1964. Shrub 10 ft. Branches dorsiventral. Flowers pendent. This is much like *G. Novæ-Caledoniæ* Vieill., from which it can be told on sight by its short, broadly campanulate flowers.

G. CONSIMILE S. Moore, sp. nov. *Arbuscula* glabra; *ramulis* subteretibus copiose foliosis; *foliis* 3·5–5 cm. × 12–15 mm. brevipetiolatis oblongo-lanceolatis lanceolatisve breviter acuminatis basi rotundatis nonnunquam obscure cordatis margine undulatis membranaceis; *floribus* in axillis foliorum solitariis pedunculo gracili prope basin bracteolato circa 1 cm. long. insidentibus; *calycis* 2·5 mm. long. alte partiti segmentis late ovatis obtusissimis margine microscopice ciliolatis; *corollæ* urceolato-campanulatæ tubo calycem duplo excedente intus prope basin piloso lobis suborbicularibus 2 × 2 mm.; *antheris* subsessilibus corollæ faucibus insertis apice breviter appendiculatis vix 1·5 mm. long; *ovario* 2 mm. diam. globoso glabro in stylum 2·5 mm. long. crassum desinente; *stigmate* didymo 1 mm. in transversum.

Mt. Canala; forest margin; 1500 ft.; mica schists. 1255. Small tree, 20 ft. Branches dorsiventral. Flowers pendent. In many respects very like the last; the dendritic habit, subterete branches and narrow flowers, with quite different stamens, also the smaller ovary with longer style, are its chief distinguishing features.

G. RUPESTRE Forst. Mt. Panié; forest margin; 1000 ft.; gneiss. 1808. Small tree. Corolla pale greenish white, slight scent. Polynesia.

GENIOSTOMA DENSIFLORUM Baill. River Ngoyé; among rocks in creek; 300 ft.; serpentine. 2088. Shrub 10 ft. Branches erect, rather fastigiate. Corolla greenish white, limb spreading, unpleasant scent.

Near this are Schlechter's nos. 14748, 14828, 15084, 15405 referred to *G. fœtens* Baill. But the type of this (*Balansa* 2169), as represented in the British Museum, is a very different plant.

Like most of Baillon's descriptions of New Caledonian plants that given of *G. densiflorum* is unsatisfactory in several respects. The identification here made is therefore to be regarded as provisional.

G. FLUGGEOIDES S. Moore, sp. nov. *Frutex*? glaber; *ramulis* subteretibus ad nodos aliquanto dilatatis foliosis; *foliis* ±4–6 × 2·5–3 cm. petiolatis (pet. ±1 cm. long.) oblongo-ovatis apice rotundatis nisi obtusissimis basi obtusis membranaceis; *floribus* in cymas axillares ramosas plurifloras 2 × 2–2·5 cm. digestis; *pedicellis* usque 3 mm. long. quam calyx sæpissime longioribus; *calycis* 2 mm. long. segmentis ovatis obtuse acutis tubo æquilongis; *corollæ* 4 mm. long, campanulatæ tubo calycem æquante intus in faucibus setoso lobis tubum æquantibus ovato-oblongis obtusis prope basin setosis; *antheris* subsessilibus corollæ ore insertis late oblongis minute apiculatis 1·55 mm. long.; *ovario* subgloboso glabro stylum gracilem breviorem fulciente 1·5 mm. diam.; *stigmate* didymo; *capsula* ovoideo-oblonga obtusa 6 mm. long.

No locality. No number.

Near *G. celastrineum* Baill., which has differently shaped leaves and much narrower and acute calyx-lobes.

G. OLEIFOLIUM S. Moore, sp. nov. *Frutex*? ramosus glaber; *ramulis* ascendentibus vel patentibus crebro foliosis; *foliis* 2–3 cm. × 5–7 mm. parvis lineari-oblanceolatis obtusis inferne in petiolum 5 mm. long. angustatis tenuiter coriaceis; *cymis* abbreviatis 2-paucifloris circa 6 × 5 mm.; *pedicellis* sat validis calyce paullo longioribus bracteolas parvulas subulatas fulcientibus; *calycis* 1·5 mm. long. segmentis tubo longioribus ovatis obtusis margine ciliolatis; *corollæ* subrotatæ medium usque divisæ tubo calyci æquilongo intus in faucibus setoso lobis late oblongis obtusissimis intus setosis; *filamentis* brevibus corollæ ore insertis antheris lanceolatis apiculatis 1 mm. long.; *ovario* depresse globoso glabro 1 mm. diam.; *stylo* brevi crassiusculo ·75 mm. long.; *stigmate* didymo ·5 mm. long.

Mt. Arago; schists. 1434 *a*.

Under the name of *G. Pancheri*, Baillon gives an imperfect description of a species with leaves in shape and size evidently much like those of the plant just described, but membranaceous in consistence and with a fine velvety indumentum below. Moreover, the cymes of *G. Pancheri* are described as several-flowered and the corollas would appear to have a longer tube than have those of *G. oleifolium*.

Fagræa grandis Panch. & Seb. Mt. Mou; damp parts of Niaouli association; 1000 ft.; cretaceous. 524.

GENTIANACEÆ.

Erythræa australis R. Br. Anse Vata; sandpit. 71. Australia.

BORAGINACEÆ.

Cordia Myxa L. Nouméa; Mt. Montravel. 18. Isle of Pines; scrubby woods; serpentine; 100 ft. 2277. Large spreading shrub or tree, 20 ft. Old World tropics.

Tournefortia argentea L. Cap N'dona; littoral zone. 875. Sea coasts from tropical Africa to tropical Australia and Polynesia.

CONVOLVULACEÆ.

Ipomœa palmata Forsk. Nouméa; Port Ngéa. 23. Common in littoral and roadsides round Nouméa. Tropics of both hemispheres.

I. congesta R. Br. Kuakué; forest near shore; serpentine. 955. Queensland, Polynesia.

Convolvulus parviflorus Vahl. Ouen Toro; littoral zone; climbing over shrubs and rocks. 771. East Indies, Malaya, tropical Australia, Polynesia.

Evolvulus alsinoides L. Kuakué; among grass and ferns in undergrowth of *Casuarina* woods; 50 ft.; serpentine. 932. Warmer regions of both worlds.

Cuscuta obtusiflora H. B. K. Tonghoué Mts.; parasitic on various plants. 170. This widely distributed species, although known from several parts of Australia, seems not to have been recorded hitherto as a native of New Caledonia. Distribution of the last.

SOLANACEÆ.

Solanum nigrum L. Mt. Dore; old cultivation area; 100 ft. 659. Ouen Toro; littoral sand. 781. A cosmopolitan weed.

S. pseuderanthemoides Schlechter. Ermitage stream; forests; 500 ft.; cretaceous. 150. Shrub 6–8 ft. Branches spreading horizontally. Petals white. Anthers yellow.

The anthers of Mr. Compton's specimens are all equal or nearly equal and polliniferous instead of one being reduced to a staminode; they are also a trifle longer (6 instead of 5 mm.). There are no flowers on Schlechter's specimens available for examination in the London herbaria, but one cannot think the difference above noted to be of specific value.

Solanum artense Montrouz. ex descript. Nouméa, Port Déspointes woods. 226. Shrub 4–6 ft. Corolla white, anthers yellow. Agrees with the description, except that the leaves are a trifle smaller.

S. torvum Sw. Nouméa; abundant in waysides and waste places. 17. Tropics of both worlds.

Nicotiana suaveolens Lehm. Anse Vata; sandpit. 68. A form of this variable species with small flowers slightly if at all larger than those of the dwarf Australian desert plant called by me var. *rosulata*. Australia.

Duboisia myoporoides R. Br. Mt. Mou; forest; 1000 ft.; cretaceous. 458. Kuakué; abundant in moister parts of scrub; 50 ft.; serpentine. 906. Mt. Canala; edge of forest; 1500 ft.; mica schist. 1262. Ignambi; forest margin; 2000 ft.; gneiss. 1484. Australia.

SCROPHULARIACEÆ.

Lindernia neocaledonica S. Moore, sp. nov. *Herba* perennis, *caule* repente hac atque illac ramos simplices vel perpauciramulosos ascendentes quadrangulares summum spithameos uti folia glabros emittente; *foliis* plerisque 2–2·5 × 1·6–1·9 cm. comparate amplis sessilibus ovatis obtusis basi rotundatis margine undulatis trinervibus; *floribus* axillaribus solitariis pedicellis gracilibus 2 cm. long. suffultis; *calycis* 5 mm. long. segmentis a basi solutis lineari-lanceolatis acutis glabris; *corollæ* albæ tubo late subcylindrico quam calyx paullulum breviore labio postico quadrato retuso 1·5 mm. long. antico 3 mm. long. hujus lobis suborbicularibus 2·5 mm. diam.; *staminibus* posticis inclusis anticorum filamentis aperte arcuatis basi appendice dentiformi auctis omnium antherarum loculis divergentibus apice haud confluentibus; *ovario* ovoideo ut stylus 2·5 mm. long.; *capsula* subglobosa calyce inclusa glabra 3·5 × 3 mm.; *seminibus* oblongis vel anguste ovoideis dilute brunneis ·3–·4 mm. long.

Tonine; ponds in stream-bed; 1000 ft. 1932.

The Australian *L. alsinoides* R. Br. would seem to be near this, but its habit, leaves, inflorescences and flowers are in several respects different. Hitherto, apparently, the presence of this genus in New Caledonia has not been recorded.

GESNERACEÆ.

Coronanthera deltoidifolia Vieill. Mt. Panié; forest; 1000 ft.; gneiss. 1789. Tonine; forest margin; 2000 ft. 1981 Tonine; moist forest; 2500 ft. 1984. Shrub or small tree. Corolla noted as creamy white, creamy yellow, or red-brown.

Coronanthera aspera Clarke. Mt. Koghi edge of forest; 3000 ft.; 1044. Shrub 6 ft. Flowers dull yellow.

C. pedunculosa C. B. Clarke. Kuakué; scrub forest (*Spermolepis*); 200 ft.; uncommon. 949. Mts. north of Ngoyé; *Spermolepis* forest and river-side; 300 ft.; serpentine. 2073. Shrub 3–4 ft. Corolla dull yellow or dull red-brown.

Depanthus, *Gesneracearum* e tribu *Cyrtandrearum* genus novum.

Calyx actinomorphus, 5-partitus, persistens. *Corolla* late campanulata; limbus breviter 5-lobus lobis inter se subæqualibus recurvis. *Stamina* 5, juxta basin corollæ affixa hujusque cum lobis alternantia, inter se similia; filamenta inclusa, inferne tomentosa; antheræ inter se liberæ loculis apice distinctis. *Ovarium* superum, 1-loculare, in stylum brevem excurrens; stigma bilobum; placentæ parietales, ∞-ovulatæ. *Capsula* ovoidea, breviter rostrata, septicide dehiscens; exocarpium coriaceum; endocarpium lignosum; valvæ 2, usque ad apicem dehiscentes. *Semina* minuta, innumera.—*Arbuscula* præter inflorescentiam fere glabra. *Folia* opposita paribus sæpe inæqualibus. *Cymæ* axillares, longipedunculatæ, paucifloræ. *Flores* pro rata parvi, pedicellati.

D. glaber S. Moore, sp. unica. (*Coronanthera glabra* C. B. Clarke, Monog. Cyrtand. 174.) (Pl. **23**.) Mt. Canala; forest; 1000 ft.; mica schists. 1171. Tree 30 ft. or more. Corolla fleshy, cream-coloured.

No. 1956 from Tonine, forest, 500 ft., is a form of this with shorter and relatively somewhat broader leaves, rounded at the base. It is a tree 25 ft. high with dull yellow flowers.

Neglecting some minor points, the nearly actinomorphic campanulate corollas with the five similar stamens seem fully to warrant the separation of this plant from *Coronanthera*.

BIGNONIACEÆ.

Diplanthera Deplanchei K. Schum. Cap Bocage; frequent in serpentine scrub; 500 ft. 1376. Corolla (scentless) and filaments yellow.

Tecoma austro-caledonica Bur. Couliné (Neketé); moist forest; 1000 ft.; schists. 1277. Ignambi; creekside forest; 1500 ft.; gneiss. 1664. Mt. Panié; forest; 1500 ft.; gneiss. 1804. Liane. Corolla white or cream, with a crimson blotch on inside of each hinder lobe.

ACANTHACEÆ.

Acanthus ilicifolius L. Mt. Dore; littoral zone, salt swamps. 656. Oubatche; mangrove swamps along edge of streams. 1608. A maritime species. Asia to Polynesia.

PSEUDERANTHEMUM TUBERCULATUM Radlk. Isle of Pines; coral forest; 50 ft.; frequent. 2258.

P. COMPTONII S. Moore, sp. nov. *Fruticosum*, ramosum; *ramulis* subteretibus ad nodos aliquanto tumidis paucifoliis puberulis mox glabrescentibus; *foliis* usque 5 × 2·5 cm. petiolatis (pet. ·5–10 mm. long.) ovato-oblongis utrinque obtusis margine leviter undulatis membranaceis utrobique præsertim in nervis puberulis; *cymis* in toto 9 × 5 cm. nisi brevioribus ex axillis foliorum superiorum oriundis laxis paucifloris puberulis; *bracteis* uti bracteolæ subulatis puberulis 3 mm. long.; *calycis* 9 mm. long. segmentis lineari-setaceis puberulis 7 mm. long.; *corollæ* tubo incurvo extus puberulo faucibus dilatatis 27 mm. long. limbo plane bilabiato labio postico late oblongo 10 mm. long. postici lobis ovato-oblongis retusis 11 × 6 mm.; *antheris* breviter exsertis oblongis obtusis basi muticis 2·25 mm. long.; *stylo* breviter exserto apice minute bifido 30 mm. long.; *capsula* acuta 18 mm. long.

River Ngoyé; *Spermolepis* forest near river; 350 ft.; serpentine. 1077. River Comboui; *Callitris* forest; 200 ft.; serpentine. 2164. Shrub 2–3 ft. high. Corolla white, scentless. Known from other Polynesian species by the shape and size of the leaves, coupled with the large corollas with a markedly swollen throat.

JUSTICIA (§ Rhaphidospora) PINENSIS, S. Moore, sp. nov. *Frutex* ramosus circa bimetralis; *ramulis* subteretibus striatulis subdistanter foliosis novellis griseo-puberulis exemptis glabrescentibus; *foliis* 3–6 × 1·5–1·8 cm. ovatis vel ovato-oblongis obtusis nisi obtusissimis retusisve basi in petiolum 5–20 mm. long. cuneatim attenuatis margine integris vel leviter undulatis membranaceis glabris; *cymis* axillaribus laxe paucifloris ±4 cm. long.; *bracteis* ±1 cm. long.; *bracteolis* circa 1 mm. long. subulatis uti cymæ et bracteæ et calyces glanduloso-pubescentibus; *calycis* 4 mm. long. segmentis lineari-lanceolatis acuminatis; *corollæ* extus sparsim pubescentis tubo calyce paullulum longiore (4·5 mm. long) a basi gradatim amplificato labio postico late ovato breviter bifido 5·5 × 5 mm. labio antico quam posticum longiore (6 mm. long.) hujus lobis lateralibus anguste oblongo-ovatis lobo intermedio ovato palato optime intruso; *capsula* inferne stipitata sursum oblongo-ovoidea acuta pubescente 13 mm. long.; *seminibus* compressis suborbicularibus breviter crebroque tuberculatis circa 1 mm. diam.

Isle of Pines; coral reef; 50 ft.; abundant. 2254. Corolla white with a few purple spots on the lower lip, scentless.

Very close to the Indian *J. glabra* Koen.; differing in the obtuse leaves, the longer more acuminate segments of the calyx, the short upper lip of the corolla and the smaller much less prominently tubercled seeds.

DICLIPTERA PUBESCENS Juss. Isle of Pines; littoral coral sand. 2256.

MYOPORACEÆ.

Myoporum tenuifolium Forst. Port Ngéa; littoral, just above high-tide mark. 46. Baie Ouémo; low cliffs near sea. 240. Mouac islet; maritime rocks and cliffs. 2391. (A form with leaves usually less, rarely a little more than 3 cm. in length.) Shrub 3–6 ft.

M. lætum Forst. Ouen Toro; sea-shore. 57. Shrub or small tree, 10 ft. Polynesia, New Zealand.

M. rotundatum S. Moore, sp. nov. *Frutex* ultra sesquimetralis glaber: *foliis* 6 × 3–3·5 mm. oblongo-obovatis apice late rotundatis basi in petiolum brevem gradatim angustatis pergamaceis uti ramuli pustulis parvulis onustis; *pedicellis* in axillis fasciculatis complanatis 5–7 mm. long.; *calycis* 5-partiti 2·25 mm. long. segmentis lanceolatis breviter acuminatis; *corollæ* albæ tubo calyce longiore 4 × 4 mm. subcampanulato lobis 5 subæqualibus suborbicularibus 3 mm. long.; *staminibus* 4 breviter exsertis; *ovario* ovoideo 4-loculari 1·5 mm. long. in stylum filiformem 3·5 mm. long. excurrente.

Anse Vata; littoral sand. 783.

Easily recognised by the leaves with their broadly rotundate tips.

VERBENACEÆ.

Lantana Camara L. Nouméa. 13. Shrub forming dense thickets. Several varieties of flower-colour. Rapidly colonising pastures and becoming a serious pest all over New Caledonia. A tropical American plant now extensively naturalised.

L. Sellowiana Link & Otto. Nouméa; roadside. 98. An introduction from South America.

Lippia nodiflora Rich. Anse Vata. 65. Weed of cultivation. Cosmopolitan.

Stachytarpheta indica Vahl. Nouméa. 96. Very abundant weed in pasture all over New Caledonia. "*L'herbe bleue.*"

Verbena bonariensis L. Nouméa; roadside weed and especially by ditches. 93. Another South American colonist.

Premna sambucina Wall. Ile Ouéré; common in *Acacia spirorbis* association on hill. 650. India and Indian Archipelago.

Gmelina neocaledonica S. Moore, sp. nov. *Frutex* elatus (anne arbuscula?); *ramulis* robustis superne foliosis minute fulvo-tomentosis mox glabrescentibus et cortice laxo cinereo longitrorsum grosse striato circumdatis; *foliis* 12–17 × 8–14·5 cm. amplis petiolatis ovatis (raro fere suborbicularibus) obtusis vel obtusissimis basi obtusis rotundatisve margine leviter revolutis trinervibus coriaceis supra nitidis glabris subtus indumento arcto minutissimo farinoso albo vel dilute brunneo vestitis; *floribus* in cymas terminales paniculam oblongam densifloram fulvo-tomentosam 10 cm. long. referentes digestis; *calyce* campanulato 5-dentato 6·5 mm. long. extus uti corolla dense fulvo-tomentoso; *corollæ* tubo infundibulari 9 mm. long. lobis posticis oblongo-ovatis quam lobi antici inter se similes et suborbiculares longioribus; *staminibus* subinclusis; *ovario* 2 mm. long. ovoideo apice setuloso 4-loculari; *stylo* breviter exserto crassiusculo fere glabro; *stigmatis* lobo postico dentiformi quam anticus multo breviore; *ovulis* vix ex apice loculorum pendentibus.

Riv. Comboui; *Callitris* forest; riverside; 200 ft.; serpentine. 2158. Corolla white with two yellow blotches on the lower lip.

The genus, which is Indian and Malayan with three outlying species in Northern and North Eastern Australia, has not been reported hitherto from New Caledonia. The new species is very different from its congeners.

VITEX TRIFOLIA L. Nouméa; common on roadsides and along sea-shore. 10. East Asia to Polynesia; elsewhere naturalised.

V. RAPINI Beauvis. Canala; serpentine scrub; 1500 ft. 1317. Shrub 5 ft. Flowers yellowish pink.

OXERA GLANDULOSA Vieill. Kuakué; by rocky forest streams; serpentine. 931. Woody twiner. Lower lobe of corolla white, rolled back at end and edges; other lobes dull yellow, rolled back at edges.

O. NERIIFOLIA Beauvis. (ex descript.). Mt. Canala; forest; 2000 ft.; schist clay. 1112. Poume; moist Niaouli association; 50 ft.; serpentine. 2357. Shrub 10 ft. Calyx pale glistening. Corolla tube white, lobes yellowish except white front lobe; strong sweet scent.

O. NERIIFOLIA Beauvis. subsp. CORDIFOLIA Dubard (ex descript.). River Dumbéa; along river banks; 200 ft.; serpentine. 822. Shrub 4 ft. Corolla white, snowy.

O. MACROCALYX Dubard. No locality. No number.

O. PULCHELLA Labill. Port Ngéa; sea cliffs. 48. Shrub 4 ft.

O. BALANSÆ Dubard. Tonine; forest; 2000–3000 ft.; hornblende. 1965. Liane, thick woody stem. Corolla white, thick texture.

O. MORIERI Vieill. Mt. Arago; forest; 800 ft.; fairly open; mica schist. 1403. Tonine; forest; 1000 ft. 1925. Liane. Flowers pendulous, ivory-white, scentless. Native name (Poyes tribe) "Ouieip."

OXERA (§ Campanulatæ) **CRASSIFLORA** S. Moore, sp. nov. *Scandens; caule* robusto subtereti glabro lenticellis maxime eminentibus crebro onusto; *foliis* 13 × 8 cm. oppositis petiolatis (pet. 2–2·5 cm. long.) ovatis obtusis basi rotundatis penninervibus coriaceis utrobique glabris pallideque nitidis; *cymis* paucis plurifloris paniculam apertam verisimiliter terminalem 11 × 12 cm. efformantibus; *pedicellis* sat validis glabris 1–1·5 cm. long.; *calyce* parvo crasso glabro 6 mm. long. segmentis 4 brevibus deltoideis obtusis vel obtuse acutis; *corollæ* carnosæ glabræ tubo 25 mm. long. inferne cylindrico superne campanulatim dilatato lobo postico 7 mm. long. suborbiculari quam laterales amplæ paullo longiore lobo antico suborbiculari 11 mm. long.; *staminibus* ex corolla circa 15 mm. eminentibus staminodiis clavatis fere 5 mm. long.; *ovario* glabro; *stylo* crassiusculo glabro breviter bifido 3 cm. long.

Mt. Canala; forest or by streams; 1000–2000 ft.; schists. 1153. Liane, thick woody stem. Corolla rich orange-coloured, scentless.

O. robusta Vieill., to which this is closely allied, has in its typical form (Vieillard, 996) markedly 3-nerved leaves, and other specimens with penninerved leaves have been referred to it in error. Besides the leaves (similar in many respects, except for the nervation) the new plant has still more fleshy corollas than the old, corollas drying light brown instead of dark brown or black and with a narrower tube, besides which the stamens and the much longer and differently shaped staminodes are inserted higher up in the corolla tube.

O. (§ Campanulatæ) **COMPTONII** S. Moore, sp. nov. *Arbor* fere 4-metralis; *caule* erecto simplici apice foliifero; *foliis* magnis 34 × 7–8 cm. subsessilibus oblongo-oblanceolatis obtusis a medio basin usque gradatim angustatis coriaceis opacis glabris; *floribus* in fasciculos cauli insidentes circa 20-floros digestis; *pedicellis* filiformibus calyce brevioribus 1 cm. long, microscopice puberulis; *calycis* (nonnunquam ob segmenta unilateraliter connata spathacei) in toto 2·6 cm. long. segmentis 2 inter se subæqualibus ovato-oblongis acutis membranaceis microscopice puberulis 2 cm. long.; *corollæ* albæ tubo 3 cm. long. a basi gradatim etsi haud magnopere ampliato leviter curvato extus puberulo limbi lobo postico (ut anticus) oblongo-ovato illo obtusissimo hoc retuso 12 mm. long.; *staminibus* extra corollam circa 7 mm. exsertis; *staminodiis* linearibus obtusis 4 mm. long.; *ovario* glabro; *stylo* breviter exserto glabro apice bifido 3·5 mm. long.

Mt. Panié; forest; 3000 ft. 1809.

Near *O. baladica* Vieill. and *O. arborea* Schlechter (which may possibly be only the former redescribed), but with important differences in the leaf and especially in the calyx.

OXERA (§ Campanulatæ) GMELINOIDES S. Moore, sp. nov. *Ramis* validis subteretibus saltem superne crebro foliosis lenticellis optime prominentibus onustis; *foliis* 9–11 × 3–4 cm. petiolatis (pet. 1–1·5 cm.) oblongo-oblanceolatis obtusissimis interdum retusis basi cuneatis coriaceis pag. inf. minutissime furfuraceis; *floribus* in paniculam racemiformem terminalem densam circa 7 × 6 cm. digestis; *calyce* parvulo campanulato 5-dentato 3 mm. long. uti pedicelli 5–7 mm. long. extus minute tomentoso; *corollæ* lacteæ extus brevissime arctissimeque fulvo-tomentosæ 3·2–3·5 cm. long. tubo incurvo inferne cylindrico superne gradatim amplificato limbi lobis tubo multo brevioribus lobo postico bipartito antico ceteris majori 6·5 × 4 mm.; *filamentis* adusque 13–15 mm. ex corolla eminentibus staminodiis 4·5 mm. long.; *ovario* minute tomentoso; *stylo* crassiusculo brevissime bifido circa 5 cm. long.

River Comboui; *Spermolepis-Casuarina* forest; by river; 100 ft.; serpentine. 2232. A small woody plant.

The affinity is with *O. sulphurea* Dubard, from which the coriaceous (not chartaceous) leaves and much longer fulvous-tomentose corollas afford an easy means of distinction. *O. Pancheri* Dubard has narrower "subacuminate" leaves and larger (4 cm.) flowers forming short, axillary, few-flowered inflorescences.

CLERODENDRON INERME L. Île Ouéré; abundant in littoral sand. 641. East Indies and Archipelago, Australia, Polynesia.

AVICENNIA RESINIFERA Forst. Port Ngéa, Nouméa; mangrove swamps. 2. A seashore plant also in Australia and New Zealand. Dr. Stapf named this for me.

LABIATÆ.

PLECTRANTHUS PARVIFLORUS Willd. Mont Mou; weed on old cultivation; 800 ft.; cretaceous. 599. Australia, Polynesia.

COLEUS SCUTELLARIOIDES Benth. Ermitage stream; on strong drifts; serpentine. 203. Corolla throat white, lower lip and tips of upper petals purple.

No New Caledonian record for this Malayan and tropical Australian species has been found.

PLANTAGINACEÆ.

PLANTAGO MAJOR L. Mont Canala; weed in pasture area. 1248. Cosmopolitan species.

MONOCHLAMYDEÆ.

By Spencer Le M. Moore.

NYCTAGINACEÆ.

Mirabilis Jalapa L. Nouméa; weed in waste places. 35. From tropical America, spread over warmer regions of the Old World.

Timeroya canalensis S. Moore, sp. nov. *Arbor*, aperte ramosa trunco apice foliigero; *foliis* usque 25 × 4–5 cm. sessilibus oblongo-lanceolatis prope apicem angustatis apice obtusis basi aliquanto attenuatis margine undulatis vel undulato-repandis membranaceis glabris; *floribus* in cymas plurifloras digestis paniculam longipedunculatam (ped. fere 20 cm. long.) laxam glabram 9 × 15 cm. efformantes; *bracteis bracteolisque* linearibus his pedicello brevioribus; *perianthio* infundibulari-campanulato medio levissime constricto 5·5 mm. long. lobis subquadratis tubo multo brevioribus; *staminibus* 11–12 filamentis leviter crassiusculis antheris perianthii os attingentibus anguste oblongo-ovatis obtusis; *ovario* anguste ovoideo-oblongo circa 1 mm. long; *stylo* crassiusculo breviter exserto 5·5 mm. long.; *stigmate* longiuscule fimbriato.

Mt. Canala; moist forest; schists; 1000–3000 ft. 1266. Known by the long, narrow, sessile, shining leaves, the long stout peduncles, and the comparatively large flowers with but few stamens.

AMARANTACEÆ.

Celosia argentea L. River Tchiem; among rocks in river course; sea-level. 1997. A common weed in the Tropics.

Amaranthus viridis L. Anse Vata; sand-pit weed. 69. A weed in the world's warmer regions.

CHENOPODIACEÆ.

Chenopodium ambrosioides L. Anse Vata; sand-pit. 66. Isle of Pines (Vao); maritime coral sand. 2271. A weed of wide distribution.

Atriplex jubata S. Moore, sp. nov. *Suffrutex* monoicus copiose ramosus furfura cinerea omnimodo arcte indutus etsi ramulis tandem glabrescentibus; *foliis* 2·25 × 1–2 cm. petiolatis (pet. 1·5 cm. long.) ovatis vel ovato-oblongis obtusis nisi obtusissimis basi cuneatis integris vel rarilobulatis crassiusculis; *floribus* in spicas breves bisexuales digestis; *perianthio* ♂ breviter 5-fido 2·5 mm. long. segmentis late ovatis inflexis concavis; *staminibus* 5 filamentis inferne dilatatis paullo supra basin inter se connatis; *ovarii rudimento* pyriformi acuto ·5 mm. long.; *bracteolis* ♀ 3 × 3 mm. inter se inferne connatis obovatis trilobatis lobis deltoideis acutiusculis integris vel lobulatis; *ovario* subgloboso ·5 mm. long.; *stylis* ovario longioribus filiformibus; *utriculo* bracteolis satis auctis inferne maxime induratis superne membranaceis ovoideis dilute brunneis 4 mm. long. omnino immerso; *seminibus* ab apice funiculi elongati suspensis 1·5 mm. diam. testa rubro-brunnea præditis.

Île Ouéré, sprawling masses on shingle and coral sand. Littoral. Membranous part of bracteoles forming a reticulate-veined wing to the utricle.

To this must be referred Vieillard, 1073, of which there would seem to be no description, though the plant has lain long in herbaria. *A. jubata* is the only N. Caledonian species.

Salicornia australis Soland. Nouméa; forms extensive sheets on salt-flats above mangrove swamps. 99. This genus is not mentioned in Guillaumin's list. Australia, New Zealand.

Sueda maritima Dumort. Anse de la Mission; edge of mangrove swamps. 421. A common sea-coast plant of wide distribution.

Salsola Kali L. Ouen Toro; sea sand. 58. Temperate regions of both hemispheres.

PHYTOLACCACEÆ.

Rivina lævis L. Anse Vata; Nouméa; sand-pit by shore. 67. A native of tropical and subtropical America and the West Indies.

POLYGONACEÆ.

Polygonum barbatum L. Mont Mou; small freshwater swamp, edge of cultivation; 1000 ft.; cretaceous. 471. Old World tropics, Australia.

NEPENTHACEÆ.

Nepenthes Vieillardii Hook. fil. Plaine des Lacs; valley forest; 200 ft.; serpentine. 355. Ibid.; sheltered valley forest by stream; 1500 ft. 356. Mont Mou; serpentine scrub of summit; 3500 ft. 632. Port Bouquet; lowland serpentine scrub; 100 ft. 2246. Poume; abundant especially by creeks; 500–1300 ft.; serpentine. 2380.

The pitchers are variously described as "green often tinged with red," "light green tinged with red," "pale greenish yellow with tinges of dark red round lips," "dull red"; the perianths as "green, red on fading," "red-purple inside," "dark chocolate."

N. humilis S. Moore, sp. nov. *Frutex* erectus, humilis; *caule* satis robusto bene folioso glabro; *foliis* 10–13 × 4–4·5 cm. sessilibus leviter amplexicaulibus ovatis nisi obovato-oblongis obtusis basin versus angustatis

coriaceis prima juventute fulvo-tomentosis citissime supra fere glabris subtus præsertim in costa centrali appresse fulvo-hirtulis dein glabrescentibus; *cirro* adusque 4 cm. long. sub ascidio aliquanto dilatato fulvo-hirtulo; *ascidiis* parvulis summum 4·7 cm. long. cylindrico-infundibularibus primo pilis hirtulis appressis indutis cito glabrescentibus alis ventralibus 3 mm. lat. fere a basi usque ad os porrectis ciliatis ore elliptico postice breviter elongato intus triente superiori glabris nitentibus deducentibus inde glandulosis detinentibusque.

Mont Mou; dry serpentine scrub; 1500 ft. 500. Low shrubby plant 10 inches. Pitcher about 1·8 cm. wide at the middle, slightly ampullæform when moistened, 18 × 8 mm. at the mouth; peristome 1 mm. deep; operculum 13 × 15 mm.; spur only some 2 mm. in length. Flowers not seen.

Different from all forms of *N. Vieillardii* Hook. fil. in the lowly habit, the small broad leaves, and small pitchers with their very short spur.

PIPERACEÆ.

Piper austro-caledonicum C. DC. Canala; liane in coco-nut grove; 200 ft. 1334. Cap Bocage; abundant in forest; 500 ft.; serpentine. 1380. Paompai; creekside forest; 50 ft.; shales. 1907. All these are ♂ plants. Ermitage stream; forest; 300 ft.; serpentine. 149. (♀ specimens.)

P. Comptonii S. Moore, sp. nov. *Frutex* scandens; *ramis* aliquanto compressis anfractuosis ad nodos tumidis pubescentibus mox puberulis; *foliis* petiolatis (pet. 1–1·5 cm. long.) late obovatis usque ad suborbicularibus apice brevissime obliqueque cuspidatis ipso obtusis basi late rotundatis nonnunquam leviter cordatis fere a basi 6–8-nervibus papyraceis supra glabris subtus primo fulvo-tomentellis cito in nervibus pubescentibus 10–11 × 10–13 cm.; *spicis* circa 8 cm. × 3 mm. oppositifoliis brevipedunculatis (pedunculis petiolos subæquantibus) linearibus obtusis foliis brevioribus; *bracteis* arcte acervatis spicarum masc. peltatis orbiculatis circa ·5 mm. diam.; *staminibus* verisimiliter 3.

Mont Panié; forest; 1500 ft.; gneiss. 1805. Female spike not seen. In shape and clothing of the leaves this plant differs markedly from its two other New Caledonian congeners.

It should be noted that the spikes to hand not being mature, the stamens are still very minute and their number may perhaps have been stated incorrectly. The upper branches bearing the spikes hang freely from the support; the lower branches which do not hang are comparatively slender with ovate leaves only 5–7 × 4–5 cm.

Peperomia Endlicheri Miq. Mont Mou; forest; 200 ft.; serpentine. 569. Ignambi; abundant in forest; 2500 ft. 1526. Norfolk Island, New Zealand.

No. 569 found in undergrowth, creeping among stones and logs. No. 1526 an epiphyte ascending trunks to 20 ft.

Peperomia leptostachya Hook. & Arn. Mont Dore; among stones in shady valley; 100 ft.; 660. Île Porc Épic; littoral zone (probably belonging to forest association). 921. Herbaceous, 1 ft. high, erect or decumbent. Australia, Polynesia.

P. insularum Miq. Mont Dore; open hillsides among scrub; 2200 ft.; serpentine. 696. Inflorescence green. A Sandwich Islands plant.

CHLORANTHACEÆ.

Ascarina rubricaulis Solms. Mont Koghi; in 12-foot scrub; 2000 ft.; serpentine. 787. River Ngoyé; mountains to N.W.; serpentine scrub; 3000 ft. 997. Nekando; serpentine scrub; 300 ft. 1085. Mont Canala; transitional forest; 1500 ft.; mica schists. 1193. Ignambi; abundant in forest; 1000–3500 ft.; gneiss. 1668. New Zealand.

MONIMIACEÆ.

Hedycarya saligna S. Moore, sp. nov. *Arbor* fere 10–metralis; *ramulis* suberectis glabris ad nodos tumidis; *foliis* parvis ±5 × 1·8 cm. petiolatis (pet. 7 mm. long.) oblongo-oblanceolatis obtusis vel obtusissimus nonnunquam emarginatis basi obtusis margine integris chartaceis glabris; *paniculis* florum ♀ 8–10 cm. long. cauli insidentibus pedunculatis (ped. 3–5 cm. long.) subplurifloris tomento subtili sordide albo indutis; *pedicellis* ascendenti-patentibus circa 8 mm. long. quam flores facile longioribus; *receptaculo* cupulari coriaceo extus albo-tomentoso 3 mm. alt. florendi temp. circa 7 mm. in transversum; *sepalis* 8 deltoideis obtusis 1 × 2 mm.; *carpellis* numerosis subturbinatis receptaculum ægre omnino obtegentibus alveolis sat altis insertis circa 5 mm. long. apice truncatis crassis 1 mm. diam.

Tonine; forest; 2000 ft. 1972. Tree 30 ft. Flowers yellowish.

According to Miss Perkins's clavis ('Pflanzenreich,' iv. 101, Nachtr. 3), this should be placed next *H. parvifolia* Perk. and Schlechter, which it much resembles in foliage. The flowers, however, are very diverse.

H. Engleriana S. Moore, sp. nov. *Arbor* glabra; *ramulis* ultimis subteretibus striatulis ad nodos aliquantulum tumidis; *foliis* usque 8 × 3–3·7 cm. rarissime suboppositis ovato-oblongis juxta apicem angustatis apice ipso obtuse acutis basi in petiolum 4–6 mm. long. coartatis integris membranaceis; *floribus* ♀ solummodo obviis in paniculam racemiformem usque 6–11 × 8–19 cm. ex caule oriundam digestis; *pedicellis* elongatis patentibus gracilibus 2–3 cm. long.; *receptaculo* disciformi margine leviter undulato

extus glabro intus in marginibus alveolarum satis altarum puberulo 9 mm. diam.; *carpellis* circa 20 receptaculum obtegentibus sessilibus obovoideis glabris 5 mm. long. stylo brevi persistente ·3 mm. long. onustis.

Mont Arago; frequent in moist forest; 1000–1500 ft.; mica schists. 1434. Tree 30 ft.

This would seem to come near *H. grandiflora* Perk., differing from it to some extent in foliage and altogether in the inflorescence. Named at Mr. Compton's request in compliment to Mons. Numa Engler, of Oubatche, and in recognition of hospitality received from and assistance kindly rendered by that gentleman.

HEDYCARYA COMPTONII S. Moore, sp. nov. *Arbor* glabra; *ramulis* ultimis aliquanto compressis striatis ad nodos leviter tumidis; *foliis* 7–8 × 3·5–4·5 cm. petiolatis (pet. ±1 cm. long.) obovatis vel obovato-oblongis apice obtusis retusisve basi cuneatis integris chartaceis; *racemis* axillaribus paucifloris foliis brevioribus circa 3 × 2·5–3 cm.; *pedicellis* sat elongatis (5–10 mm. long.) patentibus filiformibus; *receptaculo* ♀ (♂ ignoto) convexiusculo late alveolato margine undulato extus glabro intus sparsim puberulo sub fructu 7 mm. diam.; *carpellis* verisimiliter 15 receptaculum omnino tegentibus; *drupis* pro flore paucis sessilibus ovoideis stylo brevi persistente indurato coronatis 5·5 mm. long.

Mont Arago; occasional in moist forest; 1000 ft. 1419. Tree 40 ft. Receptacle seen only in the fruiting state, fleshy, white, transparent. Drupes yellow, when dried light brown.

Affinity with *H. dorstenioides* A. Gray; distinguished from it on sight by the shape of the leaves and the shorter inflorescences.

H. SYMPLOCOIDES S. Moore, sp. nov. *Arbuscula* fere 8-metralis; *ramulis* ultimis sat tenuibus angulatis glabris; *foliis* (nonnunquam suboppositis) obovato-oblongis obtusis vel obtusissimis (interdum emarginatis) nisi rotundatis basi in petiolum circa 2 cm. long. gracilemque cuneatim attenuatis chartaceis glabris 5–8 × 2–3·5 cm.; *floribus* in paniculas axillares racemiformes paucifloras microscopice sericeas 2–3 cm. long dispositis; *pedicellis* floribus longioribus ♂ 1–2 cm. ♀ 5 mm. long.; *receptaculo* ♂ subplano crassiusculo extus breviter sericeo sepalis 8 (an semper?) late deltoideis obtusis instructo 10 mm. in traversum; *receptaculo* ♀ 4 mm. in transversum cupulari crassiusculo nequaquam alte alveolato extus breviter sericeo ore undulato; *staminibus* numerosis antheris oblongis connectivo apice suborbiculari indutis 1·5 mm. long.; *carpellis* 15 receptaculum totum vix obtegentibus clavatis ·75 mm. long. stigmate æquilongo coronatis.

Mont Panié; forest; 1200 ft. 1791. (Female plant.) Tonine; forest; 2000 ft. 1869. (Male plant.) Small tree, 25 ft. Flowers yellowish green.

This would seem to be near *H. dorstenioides* A. Gray, but the foliage is not

identical nor are the flowers in several respects. The leaves of the male plant are narrower at the tip than are those of the female, but there seems no reason to doubt the conspecificity.

HEDYCARYA SPECTABILIS Perk. Kuakué, *Spermolepis* forest; 100 ft.; serpentine. 909. River Ngoyé; low forest by riverside; 500 ft.; serpentine. 971. Small tree 12–25 ft. Flowers green.

H. PERKINSIANA S. Moore, sp. nov. *Arbor*; *ramulis* ultimis sat tenuibus angulatis glabris; *foliis* 5·5–7·5 × 2–2·7 cm. brevipetiolatis (pet. 4–5 mm. long.) oblongo-oblanceolatis sub apice angustatis apice mucronatis basi obtusis vel obtusiusculis margine integris vel evidenter denticulatis membranaceis glabris; *paniculis* 12–15 × 8 cm. ex caule enatis laxe plurifloris puberulis; *pedicellis* gracilibus circa 1 cm. long; *receptaculo* plano membranaceo extus puberulo ore crebro undulato 12 mm. diam.; *staminibus* numerosis antheris late oblongis 1·5 × ·75 mm. connectivo apice expanso subreniformi undulato coronatis.

Mont Canala; locally frequent in intermediate forest; 1500 ft.; schists. 1265. Tree 40 ft. Flowers cream-coloured.

To be inserted next *H. denticulata* A. Gray, which has larger leaves on longer petioles, shorter not cauliflorous inflorescences, and somewhat smaller ♂ flowers.

TRIMENIACEÆ.

By E. G. BAKER.

TRIMENIA NEOCALEDONICA Bak. fil., sp. nov. (Pl. **21**. figs. 8–11.) *Arbuscula* circ. 30-pedalis copiose ramosa ramis glabris; *foliis* papyraceis elliptico-obovatis 7–10 cm. × 3–3·5 cm. apice acuminatis basi cuneatis supra lucidis subtus pallidioribus nervis lateralibus furcatis petiolatis oppositis, petiolis 10–12 mm. longis; *floribus* in cymas axillares dispositis; *sepalis* numerosis 10–12 arcte imbricatis concavis exterioribus minoribus 1–2 mm. longis interioribus gradatim majoribus 4–5 mm. longis; *staminibus* 12 filamentis brevissimis liberis antheris majusculis apiculatis 2·5 mm. longis longitudinaliter extrorsum dehiscentibus; *ovario* glabro 2–2·5 mm. longo 1-loculari, ovulis pendulis solitariis anatropis, stigmate sessili terminali coronato.

Mt. Panié; forest; 1200 ft. 1796. Ignambi; forest; 3000 ft. 1582. Small tree 30 ft., branching freely. Leaves bright green, reddish midrib. Perianth of scarious scales, caducous. Anthers white. Stigmas sessile.

I am indebted to Miss Gibbs for indicating the affinity of this plant. It is a most interesting extension of the geographical range of the genus, the first known species being from Fiji, then two from New Guinea, and the present one from New Caledonia.

It is easily distinguished by the character of its flowers and leaves from the previously known members of the genus:—

A. Folia ovato-lanceolata, serrata...........	*T. weinmanniæfolia* Seem. (Fiji).
B. Folia elliptico-obovata, papyracea, margine integra	*T. neocaledonica* Bak. fil. (N. Caledonia).
C. Folia lanceolata, coriacea, margine obscure serrata...............................	*T. papuana* Ridley (N. Guinea).
D. Folia oblonga, serrata	*T. arfakensis* Gibbs (N. Guinea).

LAURACEÆ.

ADENODAPHNE, *Lauracearum* e tribu *Litseæarum* genus novum.

Flores unisexuales, verisimiliter dioici, in vel extra axillis glomerulati vel racemum brevem terminalem constituentes. *Perianthii* tubus brevissimus, intus planus; segmenta 11, triseriata, extima 2 minora bracteolasque aliquanto mentientia, intermedia 4 quam intima 5 paullo majora. *Florum* masculorum stamina in toto 11–12 biseriata, addito uno (vel duo) seriei tertiæ, omnia antheris 4-locellatis introrsum dehiscentibus necnon glandulis 2 perspicuis donata. *Staminodia* 0. *Ovarii* rudimentum nullum. *Flores* feminei ignoti. *Arbuscula* glabra. *Folia* alterna nonnunquam subopposita, penninervia, coriacea. *Glomeruli* axillares, subsessiles, summopere pauciflori, bracteis parvulis stipati.

A. CORIFOLIA S. Moore, sp. unica. *Arbuscula, ramulis* sat validis subteretibus longitrorsum rimosis; *foliis* 5–6·5 × 2–3 cm. breviter petiolatis ovato-oblongis vel obtusissimis basi obtusis margine anguste cartilagineis; *glomerulis* quam folia multo brevioribus sæpius 2–4-floris; *bracteis* parvulis vix 1·5 mm. long. imbricatis pedunculum plus minus obtegentibus ovatis acutis; *floribus* pedicellis robustis perbrevibus insidentibus; *perianthii* segmentis suborbicularibus (intimis ovato-oblongis) plus minus concavis interioribus 3 × 2 mm. long. quam extima 1·5–2 mm. long. tenuioribus; *antheris* late ovatis obtusis filamento 1 mm. long. crassiusculo glandulis subglobularibus onusto circa æquilongo insidentibus.

River Comboui; *Spermolepis-Casuarina* forest; 1000 ft.; serpentine. 2233.

LITSEA NEOCALEDONICA S. Moore, sp. nov. *Frutex* suborgyalis; *ramulis* erecto-ascendentibus subteretibus striatis primo minute griseo-pubescentibus dein glabrescentibus; *foliis* 5–9 × 2·5–5 cm. sparsis raro suboppositis petiolatis (pet. 1 cm. long.) oblongo-obovatis apice rotundatis basi (interdum aliquantulum obliquis) breviter cuneatis penninervibus coriaceis supra minutissime pubescentibus subtus griseo- vel fulvo-tomentosis; *floribus* in umbellas axillares pedunculatas (ped. 5 mm. long.) trifloras dispositis; *bracteis* stipantibus 4–5 ovatis et obtusissimis vel cymbiformibus cito reflexis

verisimiliter diu vel saltem diutule persistentibus 3–3·5 × 2–3 mm. ; *pedicellis* validis fulvo-tomentosis vix 2 mm. long. ; *perianthii* tubo brevissimo limbi segmentis plerumque 4 (nonnunquam vero abortione solummodo 2) oblongis obtusis extus puberulis circa 2 mm. long. ; *staminibus* perfectis 3–5 (–6 ?) filamentis latis angustisve pubescentibus glandulis sessilibus stipitatisve onustis antheris ovatis introrsum 4-locularibus 1·25-vix 2 mm. long. ; *receptaculo* pubescente.

Nekando ; cloud forest ; 4000 ft. ; serpentine. 2121. Perianth delicate yellowish white. Female flowers and fruit not seen. There seems to be much variation in these flowers, due apparently to suppression ; moreover, in consequence of the smallness of the receptacle and its dense pubescence it is difficult to assign the stamens to their respective whorls, though these organs are sometimes more or less sepaline in shape, both as regards filament and anther, and such are presumably members of an outermost whorl. Stamens without glands occur now and then, though they are rarer than the others. *Litsea* is another instance of an Indian genus extending to Australia and hitherto unrecorded as New Caledonian.

Cassytha filiformis L. Port Ngéa ; sea cliffs ; 50 ft. 44. Île Ouéré ; littoral; abundant on bushes and also creeping over sand. 653. Widely diffused through the tropics.

HERNANDIACEÆ.

Hernandia sonora L. Île Porc Épic ; littoral zone. 918. A native of the West Indies.

H. cordigera Vieill. Baie Ba ; by creek in Niaouli region, sea-level ; mica schists. 1383.

Hernandiopsis Vieillardi Meissn. Mont Canala ; fairly often in moist and intermediate forest ; 1000–2000 ft. ; schists. 1198.

PROTEACEÆ.

Beauprea Pancheri Brongn. & Gris. Mont Koghi ; forest near summit ; 3000 ft. ; serpentine. 725. Tree 20 ft. Inflorescence greenish.

B. multijuga S. Moore, sp. nov. *Arbuscula* ; *foliis* imparipinnatis 15-jugis 50 cm. long. rhachi subtereti striatula satis gracili petiolis 15 cm. long. ; *foliolis* brevipetiolulatis oblongo lanceolatis obtusis basi valde obliquis cuneatimque angustatis margine anteriori paucidentatis lobulatisve margine posteriori integris vel subintegris papyraceis 7–8 × 1·4–2 cm. ; *inflorescentia* terminali foliis circa æquilonga paniculam pendentem laxe permultifloram referente ; *bracteis* ovato-lanceolatis acuminatis pedicellos 1·5–2 mm. long.

adæquantibus; *perianthii segmentis* oblongo-lanceolatis obtusiusculis vix 1 mm. lat.; *squamis hypogynis* parvulis ovatis obtusissimis ·2 mm. long.; *filamentis* paullo supra basin segmentis affixis antheris ovato-lanceolatis subæquilongis (1·25 mm. long.) harum connectivo excurrente mutico; *ovario* ovoideo glabro quam stylus obscure clavellatus glaber 1 mm. long. paullulum breviore; *stigmate* capitato ·35 mm. diam.

Ignambi; forest; 1000–2500 ft.; gneiss. 1673. Small tree, 20 ft. Flowers white, slightly scented. The place of this is next *B. asplenioides* Schlechter; its chief distinguishing features are the 15 (not 8 or 10) pairs of papery (not coriaceous) leaflets, the acuminate bracts, larger flowers, and different stamens.

Beauprea Comptonii S. Moore, sp. nov. *Arbor*; *foliis* 37 cm. long. ex apicibus ramorum genitis imparipinnatis 3–6-jugis rhachi sat valida subtereti obscure striolata; *foliolis* subsessilibus oblongo-lanceolatis obtusis basi obliquis gradatim angustatis margine anteriori sæpius 2–4-dentatis margine posteriori 1–3-dentatis coriaceis pag. sup. nitentibus 7·5–10 × 2–2·5 cm.; *panicula* terminali quam folia plane breviori (20 × 20 cm) ramis ramulisque ascendentibus multifloris; *bracteis* sub floribus ovatis acutis quam pedicelli 3 mm. long. brevioribus; *perianthii segmentis* lanceolatis acutis marginibus inflexis 4·5 mm. long.; *filamentis* basin versus perianthii segmentis insertis ·4 mm. long. quam antheræ lanceolatæ acutæ brevioribus; *squamis hypogynis* subevanidis; *ovario* ovoideo glabro 1·25 mm. long. stylo filiformi vix æquilongo; *stigmate* capitellato ·25 mm. diam.

Tonine; forest; 2500 ft. 1966. Tree 30 ft. Panicle much more compact than that of the preceding, with several reduced leaves springing from the lower axils. This has the coriaceous leaves of *B. asplenioides* Schlechter (but the leaflets are fewer in number) and also its short bracts. The flowers are more like those of *B. multijuga*, though with several points of disagreement. In its short panicles *B. Comptonii* markedly diverges from both species.

B. paniculata Brongn. & Gris. Mont Mou; serpentine scrub; 3000 ft. 492. Mont Koghi; open serpentine scrub above 2000 ft. 724. River Ngoyé (Mts. to N.W. of); abundant in serpentine scrub; 500–2500 ft. 998. Flowers white or white with a pink tinge.

Garnieria spatulæfolia Brongn. & Gris. Presqu'île Bogota; serpentine scrub; 1500 ft. 1318. River Ngoyé, margin of; 400 ft.; serpentine. 2106. Taom; serpentine scrub; 2500 ft. 2342. Tree or shrub. Perianth white, segments reflexed, sweet-scented. Fruits like a small plum.

Kermadecia elliptica Brongn. & Gris. Mont Panié; forest; 1200 ft.; gneiss. 1798. Tall tree, 50 ft. Floral axes and flowers yellow.

ROUPALA VIEILLARDI Brongn. & Gris. (ex descript.). Plaine des Lacs; forest in valley; 1500 ft.; serpentine. 362. Tree 25 ft. Apical crown of leaves. Cauliflorous. Flowers pale pinkish. The species is not represented in London herbaria, and, inasmuch as the description is very short and measurements are not given, it follows that this identification is a matter of some doubt.

GREVILLEA HETEROCHROMA Brongn. & Gris. River Dumbéa; frequent in riverside scrub; serpentine. 833. Shrub. Flowers white in horizontal spikes, all turning upwards.

G. VIEILLARDI Brongn. & Gris. River Ngoyé; *Spermolepis* forest, edge of river; 500 ft.; serpentine. 1014. Shrub 6 ft. Flowers white in horizontal spikes.

G. GILLIVRAYI Hook. Baie Ngo; scrubby woods; 200 ft.; serpentine. 261. Plaine des Lacs; serpentine scrub, 800 ft, and scrubby woods. 309. River Dumbéa; serpentine flood plain; 50 ft. 415. Mont Dore; low serpentine scrub; 300 ft. 689. Isle of Pines; serpentine scrub; 200 ft. 2269. Shrub or tree 12–25 ft. The flowers are noted as white (415, 689), yellow (2269), or pinkish (309).

G. ACERVATA S. Moore, sp. nov. *Fruticulus* elatus; *ramulis* sat validis cortice griseo obductis cito glabris (novellis minute sericeis); *foliis* 3–5 × 1·5–2·5 cm. petiolatis (pet. 10–15 mm. long.) oblongo-obovatis rarius ovato-oblongis vel etiam ovatis apice retusis basi obtusis pulchre nervosis coriaceis supra glabris pallideque nitidis subtus arcte argenteo- vel fulvo-sericeis; *racemis* terminalibus pedunculatis usque 9 cm. long. densifloris minute albo-sericeo-tomentosis; *floribus* brevipedicellatis (ped. vix 3 mm. long.) sericeis cerasinis; *perianthio* anguste ovoideo 8 mm. long. segmentis oblongo-lanceolatis cito disjunctis 1·5 mm. long.; *antheris* late ovatis obtusis ·75 mm. long.; *disco* parvulo semicirculari; *ovario* stipitato obliquo glabro 1·3 mm. long. stipite 2·75 mm.; *stylo* 20 mm. long. glabro; *stigmate* obliquo convexo basi parum dilatato.

Cap Bocage in scrub; 300–800 ft. 1398. Tall shrub 10–12 ft., scraggy growth. With much resemblance in respect of foliage to *G. Gillivrayi* Hook., this has markedly smaller, more densely arranged, shorter-pedicelled flowers, with a shorter-stiped ovary and convex (not conoidal) stigma.

G. COMPTONII S. Moore, sp. nov. *Frutex* vel *arbuscula*; *ramulis* sat validis inferne nudis cicatricibus foliorum delapsorum parum perspicuis notatis superne foliosis; *foliis* 6–8·5 cm. × 4–5 mm. sessilibus anguste lineari-oblongis obtuse mucronulatis basin versus gradatim coartatis margine induratis necnon leviter revolutis coriaceis pag. sup. glabris pag. inf. subtilissime cinereo-sericeis; *racemo* terminali folia facile excedente ima basi furcato

brevipedunculato multifloro fulvo-sericeo-tomentello 15 × 5 cm.; *floribus* pedicellatis (ped. 6–7 mm. long.) sericeo-pubescentibus saturate rubris; *perianthio* anguste ovoideo antice usque basin fisso 13 mm. long. segmentis lineari-lanceolatis superne incurvis cito omnino liberis 2·5 mm. long.; *antheris* late ovatis 1·2 mm.; *disco* subhippocrepiformi; *ovario* 1 mm. long. stipitato obliquo velut stipes 5 mm. long. glabro; *stylo* valido mox liberato arrectoque inferne puberulo ceterum glabro circa 2 cm. long.; *stigmate* terminali breviter conoideo glabro.

River Dumbéa; waterside; serpentine; 50 ft. 416. Judging alone from Vieillard 1113, *G. Deplanchei* Brongn. & Gris, with similar foliage, has smaller flowers on shorter pedicels, the smaller expanded tips of whose perianth segments remain joined and imprison the comparatively short style much longer than is the case with the species under notice. Apparently referable to this, but with more silky indumentum, are the following:—River Dumbéa, abundant along river banks in plain and montane regions; serpentine. 834. Kuakué, abundant in stony flood-plain of river; 50 ft.; serpentine. 908. River Comboui among riverside rocks; 100–500 ft.; serpentine. 2211. (The flowers in these specimens are noted as crimson to rose-coloured.) To these should be added:—On hills near Ngoyé; Schlechter 15104 (distributed as *G. Deplanchei* Brongn. & Gris).

Grevillea producta S. Moore, sp. nov. *Arbuscula*; *ramulis* superne foliosis cortice cinereo obductis novellis subtiliter sericeis; *foliis* ±5 cm. × 1·5–2 cm., penninervibus oblongo-oblanceolatis obtusis vel obtusissimis interdum emarginatis basi in petiolum 5–10 mm. long. extenuatis margine induratis parumque revolutis coriaceis supra glabris subtus arcte cinereo vel fulvo-sericeis; *racemis* 6–10 cm. long. sæpissime terminalibus pendulis pauciramosis (ramis patentibus) subdistanter plurifloris subtiliter albo-tomentosis; *floribus* pedicellatis (ped. 7–8 mm. long.) sericeis gilvis; *perianthio* anguste ovoideo antice omnino fisso 17 mm. long. segmentis lineari-oblongis diutule coalitis 2·25 × 1·75 mm.; *antheris* late ovatis obtusis; *ovario* 2 mm. long. stipitato obliquo ut stipes 3 mm. long. stylusque elongatus fere 4·5 cm. long. glabro; *stigmate* obliquo basi dilatato medio parum elevato glabro.

Taom; riverside scrub among pebbles and alluvium; 300 ft.; serpentine. 2318. Small tree, 15 ft. *G. macrostachya* Brongn. & Gris, to which this seems nearest, has distinctly 3-nerved leaves, more densely flowered simple racemes, and smaller flowers with a much shorter style and markedly conoidal stigma.

Stenocarpus elegans Brongn. & Gris. Baie Uié; frequent in serpentine scrub just above littoral. 855. Isle of Pines; frequent on serpentine plateau; 300 ft. 2262. Noted as a tree 20 ft. high at Baie Uié, a 3 ft. shrub in the other locality. Flowers pale or dull yellow.

STENOCARPUS MILNEI Hook. Taom; river pebbles; 300 ft.; serpentine. 2319. Shrub 4 ft. Corolla white. Style green.

S. UMBELLATUS Schlechter. Plaine des Lacs; banks of River du Carènage; 800 ft.; serpentine. 376. Plaine des Lacs; dry serpentine slopes. 311, 376 *a*. River Dumbéa, banks of; 200 ft.; serpentine. 825. Baie Kuakué; serpentine scrub; 500 ft. 881. Shrub 4–8 ft. Flowers pale yellow. Style green.

S. LAURINUS Brongn. & Gris. Pic La; serpentine scrub; 1000 ft. 858. Shrub 8 ft. Flowers white, scentless.

S. HETEROPHYLLUS Brongn. & Gris. Taom; abundant in upland serpentine scrub; 2000–3000 ft. 2329. Procumbent shrub. Flowers creamy, scentless.

S. COMPTONII S. Moore, sp. nov. *Frutex* orgyalis, glaber, *ramulis* ascendentibus superne foliosis inferne prominenter cicatriciferis cortice cinereo-fusco circumdatis; *foliis* 3 × 2–2·5 cm. nonnunquam suboppositis obovatis apice rotundatis basi in petiolum latum 2–4 mm. long. cuneatim attenuatis margine aliquanto revolutis obscure 3-nervibus coriaceis; *umbellis* sæpissime ultra 20-floris pedunculo sat valido folia subæquante fultis; *pedicellis* pedunculo brevioribus necnon tenuioribus 1 cm. long.; *disco* subhippocrepiformi; *perianthii* segmentis lineari-oblongis apice in lobum cavum late ellipticum obtusum dilatatis 1·5 cm. long.; *antheris* ovatis obtusis 2 mm. long.; *ovario* 2 mm. long. longe stipitato filiformi stipite 9 mm. long.; *stylo* stipite paullo breviore; *stigmate* obliquo basi dilatato medio breviter lateque conoideo.

Mont Dore; open scrub; 2000 ft.; serpentine. 688. The short broad leaves with rotundate ends and the many-flowered umbels are the leading features of this species.

S. PHYLLODINEUS S. Moore, sp. nov. *Frutex* suborgyalis, glaber; *ramulis* inferne nudis superne foliosis cortice cinereo-fusco obductis; *foliis* 3·5–7 cm. × 5–10 mm. lineari-lanceolatis vel lineari-oblongis obtusis basi in petiolum 1 cm. long. extenuatis coriaceis subevanide nervosis; *pedunculis* filiformibus ± 2 cm. long.; *umbellis* 5–9-floris; *pedicellis* pedunculum semiæquantibus; *perianthii* 11 mm. long. segmentis linearibus in lobum cavum suborbicularem augmentatis; *antheris* parvis suborbicularibus; *ovario* filiformi 1·25 mm. long. stipiti 8 mm. long. quam stylus æque filiformis longiori insidente; *stigmate* obliquo ambitu suborbiculari medio convexulo vix 1·5 mm. diam.

Taom; abundant in serpentine scrub; 500–1000 ft. 2314. Shrub 5 ft. The leaves of this plant are remarkably homoplastic with the phyllodes of *Acacia aneura* A. Cunn.

Knightia Deplanchei Vieill. Presqu'île Bogota; frequent in dry serpentine scrub; 1500 ft. 1320. Mont Dore; frequent in serpentine scrub; 1000 ft. 844. Shrub 4 ft. Flowers yellow.

K. strobilina R. Br. Mont Canala; forest; 2500 ft.; schists. 1120. Tree 40 ft. Corolla salmon-coloured.

THYMELÆACEÆ.

Wickstroemia indica C. A. Mey. Nouméa; Baie de l'Orphelinat; littoral coral sand and shingle. 242. River Dumbéa; woods on serpentine slopes just above stream; 200 ft. 824. E. Asia, Malaya, Australia, Polynesia.

LORANTHACEÆ.

Loranthus pustulatus S. Moore, sp. nov. *Ramis* sat validis mox lignescentibus sursum foliosis deorsum nudis lenticellorum pustulis prominentibus signatis; *foliis* 5–8 × 3–5 cm. plerumque 3 vel 4-nis subsessilibus ovatis apice rotundatis basi rotundatis leviterque cordatis crasse coriaceis glabris; *cymis* ex ramis defoliatis oriundis plurifloris glabris pedunculis 2–2·5 cm. long. insidentibus; *pedicellis* umbellatis 5–7 mm. long.; *floribus* mediocribus plerumque 2–3-nis sessilibus; *bracteis* abbreviatis dentatis; *ovario* 5 mm. long. oblongo glabro quam calycis limbus brevis irregulariter denticulatus multo longiore; *petalis* 6 linearibus apice anguste spathulatis cito omnimodo solutis 3–3·5 cm. long.; *staminibus* petalo paullo infra medium insertis filamentis compressis glabris 1·5 cm. long. antheris linearibus obtusis dorso affixis 3 mm. long.; *stylo* 3 cm. long.

Ignambi; forest; 3000–4250 ft. 1577. A parasite on various trees. Petals and filaments scarlet. A very distinct species near *L. neocaledonicus* Schlechter, but besides certain floral divergences, easily known by the broad subsessile leaves slightly cordate at the base.

L. glaucescens S. Moore, sp. nov. *Ramis* validis mox lignescentibus glabris; *foliis* 10–11·5 × 2–3 cm. monente cl. detectori 2–3–5-nis oblongo-lanceolatis apice obtusis ipso mucronatis basi in petiolum fere 1 cm. long. angustatis crassiuscule coriaceis glabris siccitate glaucescentibus; *cymis* ramis vetustioribus foliis jam orbis insidentibus; *pedunculis* 1 cm. long. pedicellos duplo excedentibus floribus mediocribus plerumque 2–3-nis sessilibus; *bracteis* vix 1 mm. long. 3-lobis lobis patentibus; *ovario* turbinato glabro 4 mm. long. calycis limbum 8-plo excedente; *petalis* 5 linearibus basin usque cito solutis 3 cm. long.; *staminibus* infra medium petalo insertis; *filamentis* 13 mm. long. filiformibus glabris antheris linearibus dorso affixis; *stylo* 3·2 cm. long.

River Ngoyé; forests and riverside; 1000 ft. 969. Semi-parasite on various trees. Begins life with a root, losing it as it climbs the tree. Haustoria plug-like. Flowers bright scarlet. Inflorescence much like that of the last species, but foliage altogether different.

LORANTHUS COMPTONII S. Moore, sp. nov. *Ramis* sat robustis inferne nudis superne foliosis ad nodos tumidis cortice cinereo crebro lenticellifero cinctis; *foliis* 8–10 × 4–6 cm. oppositis nonnunquam subopposítis breviter petiolatis oblongo-ovatis obtusis basi obtusis coriaceis glabris; *floribus* majusculis ternis in cymas breves paucifloras axillares pseudoterminalesve digestis; *pedunculis* 1 cm. pedicellis ·5 cm. long.; *bracteis* obliquis ovatis obtusis ovarium vix semiæquantibus; *ovario* 4 mm. long cylindrico quam calycis limbus cupularis 4-plo longiore; *petalis* 6, 4 cm. long. glabris triente superiori angustis solutis decurvisve inferne in tubum anguste ovoideo-oblongum connatis; *filamentis* 4 mm. long. crassiusculis quam antheræ basifixæ anguste lineari-lanceolatæ paullo brevioribus; *stylo* 4 mm. long.; *stigmate* capitato leviter sulcato.

Mont Mou, Niaouli region; damp valley; 800 ft. 600. Corollas bright yellow, the free portions red on the inside and turning downwards when open. No described New Caledonian *Loranthus* could be mistaken for this fine species. In several respects the flowers are like those of *Deplanche*, 382, hitherto apparently undescribed, but the two are very distinct as regards foliage.

L. CANALENSIS S. Moore, sp. nov. *Ramis* superne foliosis inferne nudis cortice griseo rimoso obductis glabris; *foliis* 7–8·5 × 1·7–2·7 cm. oppositis oblongis vel anguste oblongo-ovatis obtusis basi in petiolum brevissimum angustatis coriaceis glabris; *cymis* axillaribus (anne semper?) brevibus paucifloris; *pedunculis* abbreviatis 5 mm. long. quam pedicelli paullo longioribus; *floribus* usque 5·5 cm. long. ternis centrali sessili lateralibus subsessilibus; *bracteis* 1 mm. long. obliquis rotundatis; *ovario* cylindrico 3·5 mm. long.; *calycis* limbo cupulari 1·5 mm. long.; *petalis* 6 extus sparsim pilosulis triente superiori vel ultra angustis necnon solutis inferne tubum fusiformem referentibus; *filamentis* 6 mm. long. crassiusculis antheras basifixas lineares acutas circiter æquantibus; *stylo* circa 5 mm. long.; *stigmate* compresso ambitu suborbiculari.

Mont Canala; semiparasitic on forest trees; 2000 ft. 1110. Corolla yellow-orange. Near the last in respect of its flowers, but diverse in foliage.

L. ANGUSTIFLORUS S. Moore, sp. nov. *Ramis* superne foliosis ad nodos aliquanto tumidis glabris; *foliis* 4–5·5 cm. long. 4–5-nis brevipetiolatis ovato-oblongis obtusis vel obtusissimis basi obtusis crassiuscule coriaceis glabris; *cymis* verisimiliter ramis vetustioribus insidentibus; *pedunculis* 8 mm. long. pedicellos fere duplo excedentibus; *pedicellis* filiformibus ovario longioribus;

bracteis trilobis lobis patentibus 1 mm. long.; *floribus* 2·5 cm. long. ternis (anne semper?) sessilibus; *ovario* oblongo-turbinato 2·75 mm. long. calycis limbo brevi coronato; *petalis* 6 e basi brevi comparate lata anguste linearibus glabris; *filamentis* omnino adnatis antheris lineari-oblongis dorso affixis circa 1·5 mm. long.; *stylo* 2·2 cm. long.

Mont Nekando; conifer forest; 3500 ft. 1082. Parasitic on various trees. Haustoria woody. Petals crimson.

SANTALACEÆ.

EXOCARPUS PHYLLANTHOIDES Endl. Baie Ngo; serpentine scrub; 200 ft. 251. River Ngoyé; lowland serpentine scrub; 300 ft. 2148. New South Wales, Norfolk Island.

E. DILATATUS S. Moore, sp. nov. *Frutex* ramosus fere orgyalis; *phyllocladiis* oblongo-oblanceolatis obtusis basin versus gradatim extenuatis margine hac atque illac denticulatis crassiuscule coriaceis glabris siccitate haud nigrescentibus 5–8 × 2–2·5 cm.; *foliis* —— ; *floribus* in spicas vix 1 cm. long. ex phyllocladiorum dentibus ortas paucifloras digestis; *ovario* supero; *nuce* subglobose glabro aliquanto glauco 1-loculo basi disco persistente cincto 6 × 5·5 mm.

Kuakué; serpentine woods; 200 ft. 901. Shrub 5 ft. Branches, at least the highest, ancipitous, usually 2–4 mm. thick.

Apparently to be referred here is:—Mont Mou; summit scrub; 3500 ft.; serpentine. 579. The cladodes of this are usually somewhat narrower (1·5–2 cm. broad), and the inflorescences a little longer (1 cm.), but so far as can be judged without flowers, the two seem conspecific. Vieillard 3159 is most likely this species, which is at once told from its New Caledonian congeners by the broad cladodes not turned black in dying.

BALANOPHORACEÆ.

HACHETTIA AUSTRO-CALEDONICA Baill. Mont Humboldt; moist forest; 2000 ft. 1019. Mont Canala; moist forest; 3000 ft.; mica schists. 1224. Mountains N. of Ngoyé; forest floor; 2000 ft.; serpentine. 2064. Inflorescence yellowish brown or whole plant noted as bright yellow. Fruits light orange. Young plants eaten by natives.

EUPHORBIACEÆ.

EUPHORBIA HIRTA L. Anse Vata; sand-pit; sea-level. 72. Widely diffused through the warmer regions of the world.

E. DRUMMONDII Boiss. Anse Vata; sandy seashore. 81. Australia.

EUPHORBIA NEOCALEDONICA Boiss. Nouméa; common weed in roads. 92. Foliage reddish. Used as a purgative. French name "Rougette."

E. EREMOPHILA A. Cunn. Cap N'dona; littoral zone on coral and shell sand just above high tide. 871. Leaves slightly thickened, pale glaucous green. Glands yellow. Uncommon. Australia.

E. CLEOPATRA Baill. Plaine des Lacs; in slightly elevated part of level swamp plain. 339. *Ibid.*; Kaori forest. 392. A shrub (339); tree 100 ft. (392). On Pancher's authority Baillon describes this as a tree 6–8 metres high. Pancher's specimens are thus from plants intermediate as regards size between those of Mr. Compton. The shrub (No. 339) may be regarded as flowering precociously; its leaves are shorter in the stalk and narrower than those of the tree, which may reach a length of 18 cm. and a breadth of 8·5 cm., although usually smaller and often markedly so.

RICINOCARPUS NEOCALEDONICUS S. Moore, sp. nov. *Frutex* circa metralis; *ramis* subteretibus superne foliosis cortice cinereo obductis glabris; *foliis* 2–3·5 cm. × 7–10 mm. interdum suboppositis vel vere oppositis lineari-oblanceolatis obtusis in petiolum 3–5 mm. long. attenuatis decurrentibus coriaceis supra glabris leviterque nitidis subtus minutissime fulvo-tomentosis citissime glabris; *racemis* paucifloris 3–5 cm. long. bracteis oblongis obtusis dorso minute fulvo-tomentosis mox glabrescentibus inferioribus 8–13 mm. superioribus 3–5 mm. long. præditis; *pedicellis* quam flores bracteæque plane longioribus compressis glabris; *calycis* segmentis 3·5 mm. long. ovato-oblongis obtusis petala oblonga obtusa intus microscopice velutina basique pulvinulata circiter semiæquantibus; *disci* glandulis circa ·5 mm. alt. globosis vel bilobis; *receptaculo* ovoideo a basi staminifero; *staminibus* numerosis antheris filamentis brevibus fultis; *floribus fem.* ignotis.

Port Bouquet; lowland serpentine scrub; 50 ft. 2244. Shrub 3 ft. Although the female flowers and, most important of all, the ripe seeds of this are unknown, the general appearance and male inflorescence are so exactly like those of *Ricinocarpus* that there seems no reason to doubt the true position of the plant under notice.

Hitherto the genus has comprised 15 species, all endemic in Australia, with none of which could the New Caledonian species be confused.

CLEISTANTHUS STIPITATUS Müll. Arg. Port Déspointes; fairly frequent in *Acacia spirorbis* woods; 0–500 ft. 140. Ouen Toro; frequent in *Acacia* woods. 774. Ouendjam; forest; streamside; 500 ft. 1988. Small tree, 20 ft. Flowers pale yellow.

C. STIPITATUS var. HYPOLEUCUS Müll. Arg. Port Bouquet; riverside scrub; 50 ft.; serpentine. 2237. Taom; dense serpentine scrub; 500 ft. 2309. Shrub or small tree. Flowers green or yellowish-cream, scentless.

DENDROPHYLLANTHUS.

Euphorbiacearum e tribu *Phyllanthearum* genus novum.

Flores monoici, petaliferi. Fl. ♂: *Sepala* 3 inter se æqualia, æstivatione valvata. *Petala* 3 sepalis manifeste longiora. *Discus* subobsoletus. *Stamina* in centro floris 3; filamenta ima basi connata inde libera; antheræ dorsifixæ, apice appendiculatæ, loculis extrorsum dehiscentibus. *Ovarii* rudimentum 0. Fl. ♀: *Sepala* 3. *Petala* 3, quam sepala multo minora. Discus 0. *Ovarium* 3-loculare. *Styli* 3, liberi, indivisi. *Ovula* in loculis 2. *Capsula* subglobosa, in coccos 3 bivalves dissiliens; exocarpium coriaceum uti endocarpium cartilagineum tenue. *Semina* pro loculo 2 (anne semper?), triangularia, lateribus duobus plana, dorso rotunda, ecarunculata.—*Arbor* parva. *Folia* alterna suboppositave, integra, pergamacea, nervis secundariis paucis primarios haud directe conjungentibus. *Flores* pedicellati, masculi in glomerulos axillares paucifloros digesti, feminei versimiliter ex axillis solitatim oriundi.

D. COMPTONII S. Moore, sp. unica. *Ramulis* subteretibus crebro foliosis pilosis; *foliis* 4–6 × 2·5–3 cm. brevipetiolatis ovatis rarius ovato-oblongis obtusissimis basi breviter cordatis utrobique minutissime lepidotis subtus glaucis et præsertim in nervis pilosis; *stipulis* 1·5 mm. long. subulatis mox reflexis; *pedicellis* florum ♂ et ♀ filiformibus quam flores longioribus pilosis illis 5 mm. his 18 mm. long.; *sepalis* fl. ♂ lanceolatis acutis dorso pilosis 3 mm. long.; *petalis* sepalis fere duplo longioribus oblongis obtusis glabris; *filamentis* crassiusculis quam antheræ oblongæ ·25 mm. long. brevioribus; *sepalis* fl. ♀ triangularibus obtusis dorso carinulatis pilosisque 1·5 mm. long.; *petalis* minutis subulatis glabris; *capsula* subglobosa puberula 6 mm. diam.; *stylo* piloso 1·5 mm. long. coronata; *seminibus* pallide brunneis dorso microscopice rugulosis fere 3 mm. long.

Kuakué, streamside forest, 0–300 ft.; serpentine. 935. Small tree, 20 ft. Trunk erect, slender. Branches falling off as a whole. Flowers pale yellowish green.

This genus is near *Cleistanthus*, from which it is distinguished by the trimerous flowers with, in the males, petals much longer than sepals, the members of each whorl being entirely free, the absence of a rudiment of the gynæcium from the male flowers, and the free sepals and petals of the female flowers which are without a disc.

GLOCHIDION BILLARDIERI Baill. Mont Mou; edge of gulley forest; 1000 ft.; cretaceous. 461. Spreading shrub or small tree. Small yellow hanging flowers.

G. GLAUCUM Müll. Arg. Mont Panié; edge of forest; 1200 ft. 1828. Oubatche; Niaouli association; 200 ft.; gneiss. 1835. Shrub or small tree or small undershrub less than 1 ft. Flowers yellow, scented.

Var. PUBESCENS S. Moore, var. nov. Isle of Pines; serpentine plateau; 300 ft. 2276. Varietatem nobis videtur rite existimanda ob ramulos, foliorum paginam inferiorem, pedicellosque florum masculorum pubescentes.

PHYLLANTHUS BUPLEUROIDES Baill. Ignambi; along edge of forest; 2000 ft. 1481. Small woody plant with erect stem 4–5 ft. and leafy branches. No. 1326 from Presqu'île Bogota, shrub 6 ft., erect simple stem and crown of branches with opposite distichous leaves, is one of the small-leaved supposed forms of this very variable species. The pedicels of its ♂ flowers are 7 mm. in length; of its ♀ not half so long.

P. SALICIFOLIUS Baill. Mt. Arago; frequent by stream among rocks; forest; 1000 ft. 1432. This is the α *genuinus* of Müll. Arg.

P. SALICIFOLIUS Baill., var. DRACUNCULOIDES Müll. Arg. Mt. Panié; among rocks by riverside; 1500 ft. 1763. Small shrub, 2 ft. No latex. Flowers small pale yellowish, hanging below branches.

P. (§ Eleutherogynium) TRIQUETRUS S. Moore, sp. nov. *Frutex* monoicus metralis crebro ramulosus glaber; *ramulis* erecto-ascendentibus bene foliosis compresso-triquetris; *foliis* 2·5–4·5 × 1–1·5 cm. elliptico-lanceolatis obtusis basi in petiolum brevem attenuatis firme membranaceis; *stipulis* minutis triangularibus; *fasciculis* ♂ sparsifloris addito rarissime fl. unico ♀ fasciculis ♀ perpaucifloris vel floribus solitariis; *pedicellis* ♂ 2·5 mm. long. floribus circiter æquilongis; *sepalis* 5 late ovatis obtusis 1·5–2 mm. long.; *disco* subobsoleto; *staminibus* 5 filamentis liberis antheris longitrorsum dehiscentibus ·5 mm. long.; *pedicellis* ♀ 2·5 mm. long. compressis crassiusculis; *sepalis* deltoideis obtusis circa ·75 mm. long.; *ovario* 3-lobo stylis 3 brevibus simplicibus parum curvatis rigidiusculis coronata; *capsula* 3·5 mm. diam.

Mt. Canala; by stream in Niaouli region near camp; 900 ft. 1122. Evidently near *P. salicifolius* Baill., but different in the foliage and in the flowers.

P. (§ Eleutherogynium) DURUS S. Moore, sp. nov. *Frutex* ramosus glaber; *ramulis* angulatis superne compressis vel compressiusculis paucifoliis; *foliis* 3·5–5 × 2·3–3·5 cm. brevipetiolatis (pet. ±4·5 mm. long.) oblongo-ovatis obtusissimis nonnunquam retusis basi obtusis rotundatisve coriaceis; *fasciculis* pro pulvillo paucis bisexualibus; *pedicellis* gracilibus 1·5–2·5 mm. long.; *sepalis* ♂ exterioribus 1·5 mm. long. ovatis obtusis vel obtuse acutis interioribus suborbicularibus 2 mm. long.; *disco* parvo; *staminibus* 4–5 filamentis liberis quam antheræ late oblongæ obtusæ ·5 mm. long. paullulum longioribus; *sepalis* ♀ 1·5 mm. long. ovatis obtusis vel obtusissimis; *ovario* subgloboso triloculari circa 1 mm. diam.; *stylis* 3 brevibus liberis apice haud dilatatis 1 mm. long.

River Dumbéa; serpentine scrub; 100 ft. 832. Separable at first sight from others of this section by the foliage.

PHYLLANTHUS (§ Eleutherogynium) RHODOCLADUS S. Moore, sp. nov. *Arbuscula* glabra; *ramulis* satis elongatis erecto-adscendentibus præsertim sub foliorum insertionem aliquanto compressis vivis rubris; *foliis* 4–8 × 1·5–3·5 cm. lanceolatis vel ovato-lanceolatis raro ovato-oblongis acuminatis (raro cuspidulatis) apice mucronatis basi in petiolum 3·5 mm. long. cuneatim attenuatis membranaceis; *stipulis* minutis lanceolatis ciliatis; *floribus* solitariis vel binis utriusque sexus sejunctis pedicellis 3–4 mm. long. insidentibus; *sepalis* ♂ imparibus ovatis obtusis vel acutiusculis sursum minute denticulatis ·75–1·25 mm. long.; *disco* subobsoleto; *staminibus* 5 antheris 1 mm. long. ovatis obtusissimis filamentis filiformibus æquilongis fultis; *sepalis* ♀ imparibus ·75–1 mm. long. oblongo-ovatis acutis apice denticulatis coloratisque; *ovario* 3-loculari depresse globoso trisulcato glabro; *stylis* 3 elongatis simplicibus vel brevissime bifidis; *capsula* 5 mm. diam.

Ignambi; forest; 2000 ft. 1642. Very distinct in foliage and the small solitary or binate flowers.

P. (§ Eleutherogynium?) INDURATUS S. Moore, sp. nov. *Fruticulus* glaber; *ramulis* compressis superne ancipitibus crebro foliosis; *foliis* 4–5 × 2–2·5 cm. petiolatis (pet. 3–5 mm. long.) ovatis vel oblongo-ovatis obtusis obtusissimisve basi obtusissimis coriaceis; *fasciculis* bisexualibus perpaucifloris; *floribus* ♂ breviter pedicellatis (ped. 2·5 mm. long.); *sepalis* 5 suborbicularibus fere 1 mm. long.; *staminibus* 7 antheris sessilibus inter se liberis ·5 mm. long.; *floribus* ♀ subsessilibus; *sepalis* iis maris similibus; *ovario* depresse globoso 3-loculari 2·5 mm. diam.; *stylis* 3·5 mm. long. bilobis.

Cap Bocage; occasional in serpentine scrub; 100–1200 ft. 1374. Small shrub 2 ft. The affinity of this would appear to be with *P. loranthoides* Baill., but if this be correct the heptandrous andrœcium necessitates a slight alteration in the definition of the section.

P. BALADENSIS Baill. Ignambi; forest; 2000 ft.; gneiss. 1688. Small tree, 10 ft.

P. (§ Heteroglochidion) CASEARIOIDES S. Moore, sp. nov. *Suffrutex* metralis, glaber; *ramis* patentibus tetragonis superne foliosis; *foliis* magnis usque 15 × 10 cm. brevipetiolatis ovatis sub apice sæpe cuspidato-coartatis apice obtusis vel obtuse acutis basi late rotundatis tenuiter membranaceis; *fasciculis* bisexualibus multifloris circa 1 cm. in transversum; *pedicellis* ♂ quam ♀ brevioribus illis 2 mm. his 4 mm. long.; *sepalis* ♂ 5 inter se subæqualibus ovatis obtusis 1 mm. long.; *disci* glandulis prominentibus; *staminibus* 5 filamentis ·5 mm. long. liberis antheris quadratis longitudinaliter dehiscentibus ; *disco* ♀ obsoleto ; *ovario* globoso 3-loculari vix 2 mm. diam. ; *stylis* 3 liberis simplicibus filiformibus maxime incurvis fere 3 mm. long.

Tonine ; rare in moist forest ; 1500 ft. 1960. Small woody plant, 3 ft. Leaves sometimes even 20×12·5 cm., the lowest ones on a branch usually much smaller and sometimes only 6×4 cm. To be inserted next *P. baladensis* Baill., but in foliage, to go no further, quite distinct. In general appearance herbarium specimens recall to some extent *Casearia Melistaurum* Spreng.

PHYLLANTHUS (§ Heteroglochidion) COMPTONII S. Moore, sp. nov. *Frutex* monoicus, usque biorgyalis fere omnino glaber; *ramulis* compressis aliquanto anfractuosis striatis plurifoliosis ; *foliis* 7–10×6–8 cm. brevipetiolatis (pet. 5–7 mm. long.) late ovatis obtusis vel obtusissimis basi truncato-rotundatis nonnunquam levissime cordatis pergamaceis basi 3–5-nervibus supra glabris subtus ob furfuram minutissimam glaucis; *fasciculis* aut ♂ aut ♀ plurifloris; *pedicellis* ♂ floribus paullulum longioribus 2 mm. long. superne dilatatis ; *sepalis* 5 1·5 mm. long. suborbicularibus integris; *disco* prominente annulari leviter undulato; *staminibus* 5 filamentis liberis antheris quadratis longitrorsum dehiscentibus ·5 mm. long. æquilongis ; *pedicellis* ♀ iis maris æquilongis ; *sepalis* ovatis obtusis 1·5 mm. long.; *disco* obsoleto ; *ovario* subgloboso primo 1·5 mm. diam. mox 8 mm. leviter pruinoso 3-loculari ; *stylis* 3 brevibus inter se liberis indivisis ; *capsula* ignota.

River Ngoyé ; *Spermolepis* forest ; 300 ft. 2089. Woody plant with slender erect stem sometimes reaching 12 ft. high. Abundantly distinct from *P. baladensis* Baill. in foliage and other features.

P. (§ Heteroglochidion) SALACIOIDES S. Moore, sp. nov. *Frutex* metralis microscopice griseo-lepidotus ; *ramulis* angulatis paucifoliatis longitrorsum rimosis ad nodos tumidis ; *foliis* 7–10×4–6 cm. petiolatis (pet. 7–10 mm. long.) ovatis utrinque rotundatis coriaceis ; *glomerulis* bisexualibus multifloris circa 1·5 cm. diam. ; *pedicellis* sub flore dilatatis usque 5–6 mm. long. ; *sepalis* ♂ suborbicularibus inter se subæqualibus 2·5–3 mm. long. ; *disco* satis evoluto ; *staminibus* 5 filamentis ·75 mm. long. liberis antheris oblongo-ovoideis obtusis æquilongis ; *sepalis* ♀ oblongo-ovatis obtusis 4–5 mm. long. ; *disco* obsoleto ; *ovario* late ovoideo pruinoso circa 2 mm. diam. ; *stylis* 3 integris apice nequaquam dilatatis fere 2 mm. long. ; *capsula* cruda 4 mm. diam.

Baie Ngo ; in scrub on dry serpentine. 267. Foliage much like that of *P. æneus* Baill., which belongs to another section of the genus. Irrespective of floral details, the leaves are quite different in shape and texture from those of *P. baladensis* Baill.

P. (§ Heteroglochidion) MAYTENIFOLIUS S. Moore, sp. nov. *Frutex* glaber circa sesquimetralis ; *ramulis* patentibus subteretibus paucifoliatis ; *foliis*

4–5 × 2–2·5 cm. obovato-oblanceolatis obtusis basi in petiolum 3–5 mm. long. cuneatim desinentibus coriaceis opacis; *glomerulis* bisexualibus pluri- vel multi-floris; *pedicellis* utriusque sexus petiolos subæquantibus ipso sub flore dilatatis; *sepalis* ♂ parum inæqualibus late ovatis obtusis 2 mm. long.; *disci* glandulis mediocriter evolutis; *staminibus* 5 filamentis liberis quam antheræ late oblongæ obtusæ fere 1 mm. long. brevioribus; *sepalis* ♀ inter se inæqualibus oblongo-ovatis obtusis usque 2·25 mm.; *disco* evoluto; *ovario* depresse globoso glabro circa 1 mm. diam.; *stylis* 3 liberis indivisis apice haud incrassatis 1·25 mm. long.

Kuakué; forest near river's edge; 50 ft.; uncommon; serpentine. 946. The glands of the ♀ flowers, fairly well developed, are not strictly correct for § *Heteroglochidion*, but there seems no other section for the reception of this species. In the case of 2096, however (River Ngoyé; riverside scrub; 400 ft.; serpentine), apparently a form of this with larger leaves (up to 6·5 × 3·5 cm.), the disc is less developed, and may fairly be termed rudimentary.

PHYLLANTHUS (§ Heteroglochidion) SERPENTINUS S. Moore, sp. nov. *Fruticulus* monoicus copiose ramosus glaber; *ramulis* vix semispithameis ascendentibus vel patentibus tenuibus superne aliquantulum compressis; *foliis* 1·5–3 cm. long. 6–13 mm. lat. subsessilibus lanceolatis vel ovato-lanceolatis raro ovatis obtusis basi obtusis rotundatisve coriaceis; *glomerulis* perpaucifloris uni- vel bisexualibus floribus omnibus breviter pedicellatis (ped. 1 mm. long.); *sepalis* ♂ suborbicularibus interioribus 1·5 mm. long. quam exteriora majoribus; *staminibus* 5 liberis intra discum annularem sat prominentem insertis antheris reniformibus ·75 mm. long. quam filamenta longioribus; *sepalis* ♀ circa 1 mm. long. ovatis obtusis vel obtusissimis; *disco* obsoleto; *ovario* globoso glabro 2 mm. diam. stylis 3 brevissimis simplicibus liberis roseis onustis; *capsula* parva obscure sulcata glabra circa 4 mm. diam.

Poume; serpentine scrub; 500 ft. 2385. With its small leaves, flowers, and fruit very distinct in this section.

P. (§ Heteroglochidion) GNEISSICUS S. Moore, sp. nov. *Arbuscula* vel *frutex* glaber; *ramulis* angulatis necnon aliquanto compressis crebro foliosis; *foliis* 3·5–6 × 2–2·5 cm. rarissime suboppositis petiolatis (pet. 5–10 mm. long.) ovato-lanceolatis acuminatis apice obtusis vel retusis basi rotundatis pergamaceis; *glomerulis* pauci- vel pluri-floris bisexualibus masculisve; *floribus* pendentibus; *pedicellis* tenuibus ♂ 4·5 mm. ♀ 2–2·5 mm.; *sepalis* ♂ 5 subæqualibus suborbicularibus 2·5 mm. long.; *staminibus* 4 filamentis glandulis disci prominentis basi circumdatis quam antheræ ovoideæ obtusissimæ ·75 mm. long. brevioribus; *sepalis* ♀ inter se imparibus ·75–1·5 mm. long. late ovatis apice coloratis; *disco* obsoleto; *ovario* ——; *stylis* 3 liberis verisimiliter brevibus indivisisque; *capsula* parva depresse globosa glabra 6 mm. diam.

Mont Panié; forest; 4000 ft.; gneiss. 1814. Small tree 15 ft., or more; usually a low shrub. Erect main stem, dorsiventral flowering branches. Flowers creamy, pendent below the branch. *P. baladensis* Baill. has leaves different in size, shape, and texture, pedicels equalling or slightly exceeding the petioles in length, and smaller flowers and fruit.

PHYLLANTHUS (§ Heteroglochidion) TONINENSIS S. Moore, sp. nov. *Arbuscula* vel *frutex* glaber; *ramulis* brevibus paucifoliatis compressiusculis sat gracilibus; *foliis* 3·5–5 × 1·8–2·8 cm. petiolatis (pet. 4–5 mm. long.) ovatis caudato-acuminatis apice obtusis basi late rotundatis firme membranaceis; *glomerulis* bisexualibus vel masculis solemniter 2–7-floris floribus pendentibus; *pedicellis* ♂ usque 18 mm. long. ♀ 3 mm. tandem 8 mm. long.; *sepalis* ♂ inter se subsimilibus suborbicularibus 3 mm. long.; *disco* prominente filamenta 5 libera ·75 mm. long. basi cingente; *antheris* oblongis obtusis 1 mm. long.; *sepalis* ♀ ·25–1 mm. long. ovatis obtusis margine leviter ciliolatis; *disco* obsoleto; *ovario* globoso leviter sulcato glabro 4 mm. diam.; *stylis* 3 brevibus liberis integris; *capsula* globosa circa 7 mm. diam. leviter sulcata.

Tonine; abundant in forest; 2000 ft.; hornblende. 1973. Closely allied to *P. gneissicus*, but with smaller leaves of different shape and consistence and larger flowers on much longer pedicels.

P. (§ Gomphidium) PTEROCLADUS S. Moore, sp. nov. *Frutex* suborgyalis leviter pruinosus; *ramis* sat validis angulatis crebro cicatriciferis; *ramulis* foliosis longitrorsum striatulis prominenter ancipitibus novellis aliquanto pruinosis; *foliis* 1·5–3 × 1–1·7 cm. oppositis superioribus vero alternis petiolatis (pet. 3 mm. long.) ovatis vel ovato-oblongis obtusissimis basi cordatis chartaceis glabris; *stipulis* triangulari-lanceolatis obtusis cito reflexis usque 5 mm. long. persistentibus; *sepalis* ♂ ovatis obtusis interioribus medio carinatis 1·5 mm. long.; *disco* evoluto; *staminibus* 3 filamentis liberis quam antheræ ovoideæ ·3 mm. long. longioribus; *florum* ♀ pedicello 1 cm. long. valido superne insigniter incrassato perspicueque angulato; *ovario* globoso pruinoso stylis 3 brevissimis liberis simplicibus onusto; *capsula* juvenili leviter pruinosa matura 8 mm. diam. glabra in coccos 3 bivalvos dehiscente; *seminibus* 4 mm. long. testa dilute brunnea pallide nitente cinctis.

Taom; serpentine scrub; 2500 ft. 2332. Shrub 5 ft. Stem erect; flowering branches erecto-patent, dorsiventral. Branches about 5 mm. across; branchlets bearing in their leafless lower part the persistent stipules, as wide as the branches except towards the top, the wings about 1 mm. broad. This very singular species with its thin 2-edged branches, opposite leaves, and very stout pedicel to the female flowers should be inserted in the genus apparently near *P. Chamæcerasus* Baill.

Phyllanthus (§ Gomphidium) **castus** S. Moore, sp. nov. *Frutex* submetralis; *ramulis* circiter spithameis angulatis superne compressiusculis glabris; *foliis* alternis rarissime subоppositis 4–6 × 1·5–2·5 cm. brevipetiolatis (pet. 3 mm. long.) oblongis apice obtusissimis sæpe emarginatis basi obtusis leviterve rotundatis tenuiter coriaceis supra glabris subtus microscopice albo-lepidotis; *glomerulis* bi- vel uni-sexualibus paucifloris; *pedicellis* utriusque sexus capillaribus ♀ superne dilatatis ♂ 1 cm. ♀ ±1·5 cm. long.; *sepalis* ♂ oblongis vel oblongo-ovatis 2 mm. long. exterioribus obtusis nisi obtusissimis interioribus intensius coloratis apice truncatis; *disci* glandulis 3 bene evolutis; *staminibus* 3 filamentis brevissimis liberis antheris vix 1 mm. long.; *sepalis* ♀ inter se subæqualibus late ovatis obtusissimis ægre 1·5 mm. long.; *ovario* globoso glabro; *stylis* 3 brevissimis simplicibus crassiusculis ·2 mm. long.; *capsula* globosa 7·5 mm. diam.

River Comboui; *Callitris* wood; by riverside; 200 ft. 2153. Small shrub, 2–3 ft. Branches erecto-patent, somewhat dorsiventral. A very distinct species: the styles being separated down to the base, it does not go well in this section.

P. **Bourgeoisii** Baill. Paompai, among stones by creek; 0–300 ft.; shales. 1879. Small shrub, 2–4 ft. Branches spreading, dorsiventral. Young stem red. Flowers pendulous, light green.

P. **simplex** Retz., var. **myriocladus** Müll. Arg. Mont Mou; Niaouli region; old cultivation; 800 ft. 596 (in part).

P. **simplex** Retz., var. **pratensis** Müll. Arg. Mont Mou; 800 ft.; cretaceous. 596 (in part). China, India, Australia, Polynesia, in various forms or varieties, of which the two under notice are endemic.

P. **persimilis** Müll. Arg. River Dumbéa; on rocks and especially on track by stream; 200 ft. 818. Small undershrub, twiggy branches with small, thin leaves, dull red especially on upper surface, folding together along stem. Minute green flowers.

P. **sylvincola** S. Moore, sp. nov. *Frutex* supermetralis fere omnino glaber; *ramulis* (præsertim sursum) compressis interdum aliquanto anfractuosis superne plurifoliatis; *foliis* 4–9 × 2·5–4·5 cm. alternis breviter petiolatis (pet. 3–6 mm. long.) cordatis apice obtuse acutis basi 5-nervibus tenuiter coriaceis glaucis subtus minutissime albo-furfuraceis; *glomerulis* axillaribus perpauci- (verisimiliter semper 2-) floris uni- vel bi-sexualibus; *pedicellis* ♂ circa 1 cm. long. inferne filiformibus superne valde dilatatis quam pedicelli ♀ circa 1 cm. long. omnimodo filiformes multo longioribus; *sepalis* ♂ 5 suborbicularibus incrassatis mox patentibus 4·5 mm. long.; *disco* evanido; *staminibus*

14 filamentis liberis crassiusculis quam antheræ oblongæ obtusæ longitrorsum dehiscentes 1·5 mm. long. brevioribus ; *sepalis* ♀ ·5 mm. long. inter se haud æqualibus late ovatis obtusissimis ; *ovario* 3–4-loculari ; *stylis* 3–4 brevibus liberis indivisis crassiusculis circa 1 mm. long. ; *capsula* depresse globosa glabra 10 mm. diam. in coccos 3–4 bivalves dehiscente.

River Comboui ; *Callitris* forest ; 200 ft. 2159. Small shrub, 4 ft. Flowers crimson.

This being inadmissible into any of Müller's sections, the following is proposed for its reception :—

POLYANDROGLOCHIDION, sect. nov. *Disci* glandulæ utriusque sexus obsoletæ. *Stamina* libera, usque 14 ; antheræ longitrorsum dehiscentes. *Ovarium* 3–4-loculare. *Styli* 3–4, liberi, indivisi.

PHYLLANTHUS LIGUSTRIFOLIUS S. Moore, sp. nov. *Frutex* metralis crebro ramosus glaber; *ramulis* erectis vel erecto-ascendentibus inferne subteretibus superne aliquantulum compressis; *foliis* 2–4·5 × 1–2 cm. lanceolatis vel anguste lanceolato-ovatis obtusis (casu lanceolato-obovatis obtusissimisque nisi retusis) basi in petiolum 2–3 mm. long. cuneatim coartatis tenuiter coriaceis ; *stipulis* exiguis lanceolatis cito evanidis ; *glomerulis* masculis vel bisexualibus pauci- interdum perpaucifloris ; *pedicellis* ♂ 7–13 mm. long. superne sensim sed leviter incrassatis quam pedicelli ♀ longioribus necnon gracilioribus ; *sepalis* ♂ 5 suborbicularibus exterioribus paullo minoribus omnibus glabris 2·25 mm. long. ; *staminibus* 7–10 filamentis ·5 mm. long. compressis inter glandulas disci optime prominentis insertis antheris ovatis vel ovato-oblongis obtusis 1 mm. long. ; *sepalis* ♀ quam ea maris plane minoribus inter se imparibus ovato-oblongis obtusis glabris ; *disco* obsoleto ; *ovario* globoso glabro 1 mm. diam. ; *stylis* 3 brevissimis inter se liberis simplicibus ; *capsula* leviter depressa lactea in sicco dilute brunnea 6 mm. diam.

Ignambi ; forest ; 3500 ft. ; gneiss. 1538, 1709. Small, much branched shrub, 3 ft.

A new section is required also for this, as follows :—

MEIANDROGLOCHIDION, sect. nov. *Polyandroglochidioni* affinis ab ea vero abhorrens ob disci florum ♂ glandulas optime evolutas staminaque pauciora.

BREYNIA DISTICHA Forst., var. NEOCALEDONICA Müll. Arg. Île Ouéré ; littoral zone ; abundant. 643. Paompai ; forest ; 50 ft. 1913. Polynesia.

LONGETIA BUXOIDES Baill. River Ngoyé ; stones of river bed ; 100 ft. 959. Shrub 6 ft.

BURAEAVIA CARUNCULATA Baill. Kuakué ; by river's edge among big stones ; uncommon. 904. Shrub 4 ft.

CROTON INSULARIS Baill. Port Déspointes; woods. 135. Very common in woods around Nouméa. Eastern Australia.

CODIÆUM INOPHYLLUM Müll. Arg. Mt. Mou; moist part of Niaouli zone; 800 ft.; cretaceous. 510. Shrub 10 ft.

BALOGHIA LUCIDA Endl. Mt. Mou; cretaceous gully in Niaouli region; 600 ft. 545. Shrub or small tree.

ACALYPHA PANCHERIANA Baill. Mt. Mou; cretaceous forest; Niaouli region; 800 ft. 534.

A. (Acrandræ § Palminerviæ) FINITIMA S. Moore, sp. nov. *Arbuscula*; *ramulis* subteretibus deorsum cicatriciferis sursum foliosis uti petioli fulvide velutino-pubescentibus dein pubescentibus; *foliis* 8–16 × 5–13 cm. petiolis 2–6 cm. long. insidentibus late ovatis sæpius cuspidato-acuminatis apice ipso obtusis basi cordatis necnon 5–7-nervibus margine dentato-serratis basin versus integris membranaceis supra sparsim apresse puberulis cito glabrescentibus subtus in nervis pubescentibus mox puberulis; *stipulis* lineari-subulatis pubescentibus circa 3 mm. long.; *spicis* femineis axillaribus plurifloris pubescentibus usque 4·5 cm.; *bracteis* 5 mm. long. unifloris dorso pubescentibus quando complanantur suborbiculari-cordatis vix usque triente superiori 11-dentatis dentibus triangularibus acutis basalibus imminutis; *ovario* globoso arcte etsi breviter tomentoso 1·25 mm. diam.; *stylis* fere usque ad basin crebro longeque pectinatis 5–6 mm. long. roseis.

Paompai; forest margin; 400 ft.; shales. 1869. Small tree, 20 ft. Male flowers unknown. Bracts green suffused with red at least in the upper part. *A. Pancheriana* Baill., to which this stands nearest, has smaller, narrower, more hairy leaves only slightly cordate at the base, strongly hispid ♀ bracts and more shortly branched styles, the branching commencing further up.

BOCQUILLONIA SPICATA Baill. (ex descript.). River Comboui; *Callitris* forest; 200 ft. 2157. Small erect woody plant; simple stem, 5 ft. Agrees with the description so far as that goes. One of the specimens is male, the other female.

CLEIDION MACROPHYLLUM Baill. Mt. Mou; forest in gully; 1500 ft.; serpentine. 463. Ignambi; frequent in forest below 3000 ft.; gneiss. 1680. Arboreous, 12–30 ft. Flowers reddish.

C. VIRIDIFLORUM S. Moore, sp. nov. *Arbuscula*, *trunco* simplici vel sparsim ramoso; *foliis* circa 50 × 12 cm. ad apicem trunci approximatis elliptico-oblanceolatis acuminatis apice ipso obtusis margine crenato-serratis

apicem versus revera crenatis inferne in petiolum 5 cm. long. gradatim extenuatis pergamaceis pag. sup. scabriusculis pag. inf. scabriusculis necnon in costa media nervisque appresse puberulis; *racemis* ♂ foliis longioribus (60 cm. long.) in glomerulis sparsis inter se ±1 cm. distantibus multifloris consistentibus pubescentibus; *floribus* subsessilibus tomentellis; *sepalis* 3 ovatis obtusis 1·5 mm. long.; *staminibus* circa 40 filamentis compressis superne angustatis quam antheræ subquadratæ 25 mm. long. paullulum longioribus; *racemis* ♀ usque 30 cm. long. gracilibus pubescentibus; *sepalis* 3, 5·5 mm. long. ovato-oblongis acutis obtusisve pubescentibus pedicellum sat validum pubescentem longit. æquantibus; *ovario* subgloboso tomentoso 3-loculari 2·5 mm. diam.; *stylis* basi connatis 6 mm. long. alte bipartitis ramis dense papilloso-pubescentibus roseis; *capsula* subtiliter pubescente 7 mm. diam.

Tonine; forest; 1000 ft.; locally abundant. 1931. Small tree; stem simple or slightly branched. Crown of alternate dark green leaves. In foliage very like *C. macrophyllum* Baill., but with the subsessile green (not red) male flowers in denser glomerules and, among other features, the entirely diverse calyx of the female flowers, abundantly different from it.

Balansa's 1919 from Mt. Canala and Vieillard's 2194 from Wagap, though with some differences in the shape and size of the leaves, appear to belong here.

CLEIDION VIEILLARDI Baill. Nekando; *Spermolepis* forest; 500 ft.; serpentine. 2116. Riv. Comboui; creekside forest; serpentine alluvium; 50 ft. 2231. Small tree, 15 ft.

C. SYLVESTRE S. Moore, sp. nov. *Arbuscula*; *foliis* usque 20×5·5–7 cm. approximatis oblanceolato-obovatis apice obtusissimis rotundatisve ipso mucronatis basi in petiolum 10–12 mm. long. sensim extenuatis tenuiter coriaceis utrobique leviter scabriusculis apicem versus undulatis vel sparsim undulato-denticulatis; *stipulis* ovatis obtusis sursum minute denticulatis aliquantulum resinosis 5 mm. long.; *racemis* ♂ 10–16 cm. long. cauli insidentibus microscopice puberulis horum glomerulis paucifloris; *floribus* breviter pedicellatis pedicellis filiformibus; *sepalis* 3 reflexis ovatis obtusissimis vel obtusis microscopice puberulis vix 2 mm. long.; *staminibus* valde numerosis antheris subreniformibus quam filamenta ·5 mm. long. filiformia paullulum brevioribus; *racemis* ♀ ±25 cm. long. axillaribus compressis flore paucos distantes binatim gignentibus nisi solitatim; *pedicellis* elongatis (±5 cm. long.) superne incrassatis uti recemi axis et sepala et ovarium microscopice puberulis; *sepalis* 3 ovatis acutis concavis 1·5 mm. mox. 2 mm. long.; *ovario* subgloboso trigono tempore pollinationis calyci circiter æquilongo 2·25 cm. diam.; *stylis* basi connatis alte bipartitis dense papilloso-pubescentibus tandem 13 mm. long.; *capsula* 8 mm. diam. alte 3-sulcata.

Taom; creekside forest; 300 ft.; serpentine. 2338. Small tree reaching 25 ft.; flowering when only 2 ft. high. Among the differences between this and *C. Vieillardi* Baill. may be cited the base of the leaves, the broad stipules not nearly so long as the petioles, and the male racemes borne on the old stems and not axillary.

To be referred here, but with narrower leaves only 4 cm. or rather less at their widest part, is the following:—Mt. Humboldt; streamside forest; 1500 ft.; serpentine. 1040. Tree 25 ft., monœcious. Male inflorescence sometimes 3 ft. long, on old wood; perianth green. Female inflorescence shorter, on new wood up to 10 inches long. Fruits white.

CLEIDION PANDURATUM S. Moore, sp. nov. *Frutex* orgyalis; *foliis* majusculis 25 × 7 cm. panduriformibus apice rotundatis basi truncatis petiolo 5 mm. long. validissimo insidentibus coriaceis supra leviter scabriusculis subtus microscopice puberulis; *racemis* ♀ solummodo lectis axillaribus foliis circiter æquilongis paucifloris compressiusculis; *bracteis* exiguis circa 1 mm. long. subulatis acutis; *pedicellis* validis angulatis pro rata brevibus primo 4–6 mm. postea 1 cm. long.; *sepalis* rubris late triangularibus acutis 1·5 mm. long. uti ovarium subglobosum 2 mm. diam. microscopice puberulis; *stylis* 3 ima basi connatis alte bipartitis papilloso-pubescentibus 8 mm. tandem 18 mm. long. saturate roseis.

Kuakué, streamside forest, sea-level; serpentine. 933. Shrub 6 ft., probably becoming a tree. The fiddle-shaped leaves serve to distinguish this species at sight.

C. CLAOXYLOIDES Müll. Arg. Riv. Comboui; abundant in *Callitris* forest; 200 ft.; serpentine. 2161. Small woody plant reaching 8 ft. As the female inflorescence of this plant would seem to be still undescribed, the following short diagnosis is given:—

Racemi ♀ axillares, foliis breviores, pauci- (circa 4-) flores, usque 7 cm. long. *Pedicelli* superne incrassati, sub fructu 1·5 cm. long., sub flore verisimiliter immaturo 3 mm. solummodo adequantes. *Styli* 3, alte bipartiti, saturate rubro-papillosi, tandem 17 mm. long. *Capsula* subgloboso-trisulcata, leviter puberula, 7 mm. diam.

C. COMPTONII S. Moore, sp. nov. *Arbuscula*; *ramis* aliquanto compressis superne foliosis glabris; *foliis* haud approximatis oblanceolatis vel oblanceolato-oblongis acutis nonnunquam brevissime acuminatis basi in petiolum ±15 mm. long. gradatim attenuatis margine dentato-serrulatis glabris 12–18 × 2·5–4 cm.; *racemis* utriusvis sexus axillaribus masculis foliis circa æquilongis ex axillis summis oriundis gracilibus glomerulos plures plerumque 4–8-flores ferentibus; *floribus* breviter pedicellatis (ped. 2 mm. long.) viridibus; *sepalis* 3 ovatis apiculatis extus microscopice lepidotis vix

2 mm. long.; *staminibus* valde numerosis; *racemis* ♀ 5–7 cm. long. gracilibus paucifloris flores masculos revera itaque foventibus; *pedicellis* circa 12 mm. long. sub flore incrassatis; *sepalis* (1 mm. long.) 3 triangularibus acutis ovario griseo-pubescenti circiter æquilongis microscopice lepidotis; *stylis* 3 basi connatis alte bipartitis papilloso-pubescentibus 1 cm. long.

Riv. Ngoyé; *Casuarina* forest by river-side; 500 ft.; serpentine. 2113. Small tree. This can be distinguished from *C. claoxyloides* Müll. Arg. by the acute leaves, the longer inflorescences, and the smaller female flowers with their hairy ovary and much shorter styles. From the same locality and conspecific apparently with the above, but distinguished from it by the leaves with shorter (5 mm. long.) and stouter petioles, longer ♀ racemes (10–17 cm. long.), and shorter pedicels to the ♀ flowers (5 mm. long. at time of pollination), is 2100, a small tree reaching 15 ft., flowering when about 5 ft. high. The bisexual racemes of *C. Comptonii* are a curious feature of seemingly hitherto unrecorded occurrence in the genus.

Cleidion obovatum S. Moore, sp. nov. *Arbuscula*; *ramis* ramulisque inferne nudis superne foliosis cicatricibusque foliorum mortuorum scutiformibus ornatis; *foliis* 5–15 × 3–7 cm. subsessilibus approximatis spathulato-obovatis apice rotundatis ipso sæpe mucronatis basi longe petioliformi-extenuatis margine ægre usque ad partem petioliformen prominenter crenato-serratis papyraceis in nervis paginæ utriusque appresse pubescentibus ceteroquin fere glabris; *stipulis* lanceolatis acuminatis dorso pubescentibus fere 5 mm. long.; *racemis* axillaribus ♂ usque 15 cm. long. pubescentibus quam ♀ sparsim puberuli 5–9 cm. long. longioribus; *glomerulis* ♂ satis approximatis plurifloris; *floribus* brevipedicellatis; *sepalis* 3 ovatis acutis apice breviter setosis vix 2 mm. long.; *staminibus* ultra 40 filamentis complanatis quam antheræ ovatæ longioribus; *pedicellis* ♀ 3–5 mm. sub fructu ±1 cm. long. sat validis sursum dilatatis appresse pubescentibus; *sepalis* 3 triangularibus acutis dorso carinatis microscopiceque puberulis 1·5 mm. long.; *ovario* breviter cylindrico pubescente 2 × 2·5 mm.; *stylis* 3 ima basi connatis alte bipartitis rubro-papillosis circa 1 cm. long.

Paompai; forest; 100–1000 ft.; shales. 1864. Small tree, 20 ft. The foliage, among other features, at once serves to identify this species.

C. paucidentatum S. Moore, sp. nov. *Arbuscula* glabra; *ramis* patentibus sat validis superne foliosis; *foliis* 10–18 × 3·5 cm. petiolatis (pet. 1–2 cm. long.) oblongo-oblanceolatis obtusis vel obtusiusculis interdum breviter cuspidato-acuminatis basi sensim extenuatis margine leviter revolutis paucidentatis coriaceis; *racemis* ♂ compositis foliis circa æquilongis paniculatis sat gracilibus florum glomerulis pauci- (sæpe 2–4-) floris satis approximatis onustis; *sepalis* 3 suborbicularibus 1·75 mm. long.; *staminibus* ultra 30 filamentis inferne compressis antheras subreniformes circa adæquantibus;

racemis ♀ masculis æquilongis paucifloris; *floribus* solitariis vel binis pedicellis deorsum filiformibus sursum incrassatis 12 mm. sub fructu 13–15 mm. long. fultis; *sepalis* 3 triangularibus obtusiusculis vix 1 mm. long.; *disco* in glandulis 3 oppositisepalis stipitatis suborbicularibus constito; *ovario* globoso 2 mm. diam. uti sepala minutissime lepidoto; *stylis* 2–3 inferne connatis adusque medium divisis dense papillosis saturate roseis 12 mm. long.

Ignambi; intermediate forest; 300 ft.; gneiss. 1705. Small tree, irregularly spreading branches. Leaves toothed only for 1·5–3 cm. from the apex.

Remarkable for the leaves with only apical toothing and the glands of the female flowers.

MACARANGA ALCHORNEOIDES Pax & Lingelsh. (ex descript.). Baie Ba, wet seashore woods among swamp niaoulis; schists. 1402. Small tree, 15 ft. Flowers green. Answers the description well: the male spikes never exceed 25 cm. in length. The female flowers of this plant still remain to be discovered.

M. LONGISPICA S. Moore, sp. nov. *Arbor* fere omnino glabra; *foliis* 16–21×6·5–9 cm. juxta apicem ramulorum approximatis longipetiolatis (pet. 7–12 cm. long.) late ovato-lanceolatis rarius ovato-oblongis apice obtusis retusisve basi eglandulosis breviter peltatis truncato-rotundatisque margine undulatis tenuiter coriaceis leviter nitentibus supra glabris subtus in nervis microscopice puberulis alibi minute pustulatis; *stipulis* subulatis cito deciduis; *racemis* ♂ modo cognitis ±30 cm. long. glomerulis numerosis paucifloris in axi gracili glabro sedentibus; *floribus* subsessilibus dilute viridibus; *sepalis* 3 ovato-oblongis obtusis 1·5 mm. long.; *staminibus* 4–5 antheris quadratis quam filamenta parum brevioribus ·5 mm. long.

River Ngoyé; forest; 500 ft.; serpentine. 2098.

Close to *M. alchorneoides* Pax & Lingelsh., but scarcely conspecific on account of the differently shaped leaves and the larger (male) flowers with longer and narrower sepals and only 4–5 stamens.

M. CORIACEA Müll. Arg. River Ngoyé; 400 ft.; serpentine. 2104. Small tree, 15 ft. Stigmas dull red. Anthers whitish. The characteristic glands at the base of the leaf are, if at all, never well developed in Mr. Compton's specimens.

M. MISTA S. Moore, sp. nov. *Arbuscula* innovationibus minute ferrugineo-lepidotis citissime glabrescentibus; *ramulis* subteretibus superne foliosis cortice cinereo subtiliter rimoso necnon lenticellifero prominenterque cicatricifero obductis; *foliis* 10–13×5–7 cm. sat longipetiolatis (pet. 3·5–5 cm. long.) ovatis apice cuspidato-acuminatis ipso obtusis vel obtusissimis nonnunquam emarginatis basi obtusis levissime cordatis glandulisque destitutis margine sæpe leviter undulatis tenuiter coriaceis glabris pagina utraque aliquanto nitidis; *racemis* terminalibus axillaribusve usque 9 cm. long. masculis paniculatis cum vel absque floribus inferioribus femineis perpaucis femineis ipsis racemosis cum vel absque floribus paucis masculis racemis utriusque sexus fulvo-pubescentibus; *floribus* ♂ sessilibus in glomerulos plurifloros collectis ♀ plane pedicellatis; *sepalis* 3 (1 mm. long.) ovatis obtusis apice lepidoto-glandulosis; *staminibus* circa 18 antheris quadratis quam filamenta applanata brevioribus; *floribus* ♀ pedicellis sat validis fulvo-glandulosis fultis; *sepalis* 5 (anne semper?) lineari-lanceolatis dorso lepidotis; *ovario* quadrato-subgloboso dense sed subtiliter tomentoso 1·5 × 2·5 mm. postea 3 × 6 mm. stylis 2 ima basi connatis crassiusculis 3 mm. long. onusto.

Isle of Pines; creekside; 300 ft.; serpentine. 2268. Small tree, 18 ft. Flowers greenish. Besides the peculiar characteristic and often bisexual inflorescence, this differs from *M. coriacea* Müll. Arg. in the leaves narrowed above and wanting the two basal glands, also in the sepals, ovaries, and stigmas of the longer-pedicelled female flowers.

MACARANGA MEIOPHYLLA S. Moore, sp. nov. *Arbuscula* monoica; *foliis* subsessilibus pro rata parvis (5–7 × 2–3·5 cm.) petiolatis oblongo-ovatis rarius ovatis apice sæpe acuminatis ipso obtusis obtusissimisve basi cuneatis vel rotundatis ibique biglandulosis papyraceis supra glabris subtus punctuloso-glandulosis; *inflorescentiis* summum 10 cm. long. masculis nisi bisexualibus sc. floribus masculis cum perpaucis femineis intermixtis; *racemis* ♂ foliis circa æquilongis paniculatis fulvo-pubescentibus; *floribus* in glomerulos plurifloros aggregatis; *sepalis* uti præcedentis; *staminibus* 16 filamentis ·3 mm. long. antheras longit. vix excedentibus; *pedicellis* florum ♀ brevibus validis pubescentibus; *sepalis* 3 (anne semper?) circa 1 mm. long. ovatis obtusis; *ovario* uti præcendentis; *stylis* 2 a basi liberis abbreviatis papilloso-pubescentibus rubescentibus 2 mm. long.

Paompai; creekside; 200 ft.; shales. 1880. Small tree, 25 ft. Has smaller and thinner leaves than *M. mista*, pustular-glandular on the underside and provided with basal glands. Moreover, the stamens have shorter filaments, the sepals of the female flowers are much broader, and their shorter styles are quite separated at the base.

M. PORRECTA S. Moore, sp. nov. *Arbuscula*; *ramulis* validis tetragonis fulvo-tomentosis dein glabrescentibus; *foliis* 5 × 5 cm. longipetiolatis (pet. 8–12 cm. long.) suborbiculari-cordatis apice cuspidato-acuminatis ipso obtusis basi 7–9-nervibus necnon eglandulosis margine leviter undulatis pergamaceis supra costis pubescentibus exemptis cito fere glabris subtus præsertim in nervis pube grisea glandulisque permultis dilute flavis lucentibus obtectis; *stipulis* lanceolato-subulatis dorso tomentosis mox deciduis 2 mm.

long.; *inflorescentiis* ♂ 30 cm. long. in axillis superioribus solitariis flores innumeros exiguos subsessiles ferentibus fulvo-tomentosis; *floribus* ♀ ignotis; *sepalis* 3 orbicularibus concavis dorso apice sæpe pauciglandulosis 1 mm. long.; *staminibus* 10 antheris 4-locellatis ·35 mm. long.

Hienghene; littoral zone. 2005. Branches 6–8 mm. across, light blue-grey when the tomentum has disappeared. Flowers pale green. A singular plant, apparently belonging to this genus.

MACARANGA INSULARIS Schlechter. Tonine; forest; 1500 ft.; hornblende. 1950. Small tree, 20 ft. Flowers dull green. Stigmas yellowish. Diverse from type in the smaller leaves (generally 7–9 × 2·5–4 cm.), the small sepals of the ♀ flowers, and the longer and broader styles, often (perhaps always in later stages when full lengthening has taken place) united for some distance below, yet in spite of these features apparently conspecific with it.

HOMALANTHUS NUTANS Pax. Mt. Mou; margin of forest; 800 ft.; serpentine. 603. Mt. Panié; creekside forest; 500 ft.; gneiss. 1803.

H. REPANDUS Schlechter. Ignambi; forest; 2000 ft.; gneiss. 1644.

EXCÆCARIA AGALLOCHA L. Port Ngéa; Nouméa; littoral zone just above high tide. 27. Ouen Toro; littoral zone. 59. E. Asia, Indian Archipelago, Australia, Polynesia.

BALANOPSIDACEÆ.

BALANOPS BALANSÆ Baill. Mt. Nekando; coniferous forest; serpentine. 1074.

B. RETICULATA S. Moore, sp. nov. *Arbor* glabra, sat elata; *ramulis* prominenter paucistriatis cortice brunneo-griseo obductis deorsum nudis cicatricibusque foliorum necnon florum occasorum notatis sursum foliosis; *foliis* 5·5–7 × 2–2·5 cm. breviter petiolatis plerisque verticillatis anguste obovato-oblongis apice obtusissimis vel emarginatis basi obtusissimis margine integris leviterque revolutis valde coriaceis opacis utrobique perspicue reticulato-nervosis; *drupis* extra-axillaribus solitariis sessilibus subglobosis glabris nitidis cupula ex bracteis paucis 3-serialibus late rotundatis dorso dense griseo-tomentosis constita arcte cinctis.

Ignambi; forest; 2000 ft.; gneiss. 1520. Tree 50 ft. *Cupule* 6 × 8 mm., its bracts increasing in size from below upwards, the uppermost 4 × 8 mm. *Fruit* (apparently not quite ripe) green, but drying brown, 6 × 6·5 mm., completely 2-celled, still crowned by the two short fleshy bipartite styles. *Seed* black, 2·5 mm. long at the stage reached when gathered.

Nearest *B. Balansæ* Baill., which has shining leaves more markedly narrowed at the base and not at all prominently reticulate, and moreover with much less tendency to a verticillate arrangement, also larger ciliolate cupulate bracts and larger oblong drupes.

BALANOPS PANCHERI Baill., var. SIMPLEX Baill. (ex descript.). Mt. Poume; abundant in serpentine scrub; 0–1300 ft. 2366. Low woody shrub reaching 4 ft., sometimes branched from the base, usually with simple stem. Answers the description so far as that goes, except for the somewhat smaller leaves (up to 13·5×2·8 cm. as against 15×4 cm.). The ripe fruits, hitherto undescribed, are broadly ovoid, and 2 cm. long by about 1·7 cm. in width. Baillon gives Mt. Poume as the locality for this variety.

B. ACICARPA S. Moore, sp. nov. *Frutex* metralis glaber; *caule* sæpissime simplici sub foliis subtereti cicatricibus foliorum florum gemmarumque crebro ornato cortice cinereo-nigro levi necnon nitenti obducto; *foliis* 12–15×3·5–5 cm. saltem inferioribus fere constanter verticillatis oblongo-oblanceolatis apice obtusissimis nisi rotundatis basi in petiolum latum 1–1·5 cm. long. angustatis margine revolutis usque ad medium undulato-denticulatis aliter integris crasse coriaceis; *floribus* femineis axillaribus solitariis; *bracteis* pluribus circa 7-serialibus ovatis apice rotundatis ipso sæpe nigro-mucronatis exterioribus 1–2·5 mm. intermediis 5–6 mm. long. intimis acuminatis fere 10 mm. long. inferioribus fuscis glabrisque ceteris facie utraque præsertim vero exteriori albo-sericeis; *fructu* adhuc immaturo compresso ovoideo-acuminato 2-loculari glabro fere 2 cm. long. ad medium 9 mm. in transversum stylorum 2 sat validorum puberulorum reliquiis onusto.

Cap Bocage; frequent in dry serpentine scrub; 100–1300 ft. 1365. Shrub 3–4 ft. Stem usually simple. Fruit in dry state a dull brick-red with a few longitudinal furrows.

At first this was thought to be a form possibly of *B. Theophrasta* Baill., a species not represented in our herbaria; but this is described as having much larger leaves (up to 30×10 cm) lengthily narrowing into the petiole, while the drupe (3×1·5 cm.) is invested by a cupule of bracts of which all are acuminate and are villous on the back and elsewhere glabrous.

TRILOCULARIA SPARSIFOLIA Schlechter. Mountains to north of Ngoyé; *Casuarina* forest; 2500 ft. 2067. Large tree, 35 ft. This is a fortunate discovery, the specimens being those of the male plant hitherto unknown. To the generic description (Bot. Jahrb. xxxix. 94) the following addition should be made:—

Flores masculi in amenta sparsa pauciflora disposita ex ramulis inter folia oriunda. *Stamina* sæpissime 3–5, quodque bractea minuta sæpius stipatum, feminei rudimentum parvulum 2–3-lobum circumdantia; antheræ lateraliter dehiscentes.

Balanops, it may be remarked, has only one bract to each male flower and no female rudiment. The catkins are usually 1 cm. or so in length and the subcylindrical anthers 2 mm. Schlechter got his specimen (also at Ngoyé) from a shrub of 1½–2½ metres ; apparently a case of precocious flowering.

URTICACEÆ.

TREMA ASPERA Bl., var. MICROPHYLLA Schlechter. Taom ; serpentine scrub ; 500 ft ; rare. 2303. Shrub 2 ft. Australia (the species).

T. VIEILLARDII Schlechter. Mt. Mou ; moist forest ; 800 ft. ; cretaceous, 506. Shrub 10 ft.

PARASPONIA ANDERSONII Planch. Mt. Mou ; damp part of Niaouli zone ; 800 ft. ; cretaceous. 511. Shrub 10 ft. Flowers white. Polynesia.

MORUS ALBA L , var. INDICA Bur. Ignambi ; creekside forest ; 1500 ft. ; gneiss. 1610. A widely cultivated plant.

MALAISIA TORTUOSA Blanco, var. VIRIDESCENS Bur. Port Déspointes woods. 224. E. Asia, Malaya, Australia, Polynesia (the species).

FICUS MANGIFERIFOLIA Warb. Ignambi ; forest ; 2000 ft. ; gneiss. 1629. Mt. Panié ; frequent in rocky parts of forest ; 1500 ft. 1801. A small tree (1629) or shrub 6 ft. (1801).

F. MUTABILIS Bur. Paompai ; forest margin ; 1000 ft. ; shales. 1898. Shrub 6 ft. Fruits dark green.

F. NITIDIFOLIA Bur. Riv. Comboui : *Spermolepis* forest margin ; 600 ft. 2202. Tree 20 ft. Fruits green when young, ripening through yellow to rose-red.

F. PROLIXA Forst. Ouen Toro ; seaside forest. 52. Banyan with spreading roots and accessory trunks. Latex buff-coloured. Polynesia.

F. AUSTRO-CALEDONICA Bur. River Ngoyé, margin of ; 500 ft. ; serpentine. 2102. Tree 25 ft. Smooth grey bark. Trunk simple, branches spreading. Fruits red-brown with green blotches, soft and pulpy. Sticky white latex.

F. PROTEUS Bur. Mt. Mou ; moister parts of Niaouli association ; 1000 ft. ; cretaceous. 521. Paompai ; creekside wood ; 50 ft. ; shales. 1903. Tree 30–40 ft. Trunk simple. Branches wide-spreading. Fruits erect, green tinged brown. Latex creamy.

FICUS PROTEUS, var. DENTATA Bur. Paompai; among rocks by creekside; 50 ft. 1884. Small tree, 25 ft. Spreading branches. Fruits dull green tinged with brown. Latex creamy.

F. RACEMIGERA Bur. Mont Canala; wet forest; 1000 ft.; mica schists. 1203. Tree 25–40 ft. Weak milky latex. Fruits in big branching panicles on main trunk.

F. COMPTONII S. Moore, sp. nov. *Arbor* magna; *ramulis* haud validis sursum foliosis foliorum cicatricibus clypeiformibus crebro notatis minute puberulis cito glabris; *stipulis* oblongo-ovatis obtusis extus sericeis circa 4 mm. long.; *foliis* 12–17 × 3–5 cm. oblongo-oblanceolatis sub apice angustatis apice ipso obtusis retusisve basi in petiolum latum 1·5–2 cm. long. sensim angustatis chartaceis utrobique glabris costis lateralibus utrinque 8–10 medium usque fere rectis inde dichotomo-arcuatis uti costa media reticulumque satis arctum pagina utravis præcipue vero inferiori facile aspectabilibus; *receptaculis* parvis 7 × 6·5 mm. binis pedunculatis subglobosis secus rhachin efoliatam puberulam e trunco enatam 40 cm. long. ordinatis; *pedunculis* minute sericeis apice bracteas squamiformes rotundatas ciliolatas gerentibus; *bracteis* receptaculi externis ovatis obtusis quam interiores oblongæ obtusæ decurvæ 2 mm. long. brevioribus; *perianthii* (♀) segmentis 3 ovatis obtusis rubro-punctatis ·4 mm. long.; *ovario* subrecto quam perianthii segmenta paullo breviore in stylum vix terminalem apice subæqualiter bicrurum exeunte.

Ignambi; forest; 2000 ft.; gneiss. 1643. Different from *F. racemigera* Bur., so far as regards naked-eye characters, in foliage and peduncled receptacles.

F. LEPTORHACHIS S. Moore, sp. nov. *Ramulis* tenuibus subteretibus pubescentibus cito puberulis; *stipulis* oblongis obtusis extus minute puberulis 7 mm. long.; *foliis* 8–10 × 2·2–3 cm. petiolatis (pet. 1 cm. long.) oblongo-lanceolatis obtusis vel obtusissimis basi obtusis chartaceis glabris costis lateralibus utrinque 8–10 pluribus aliis valoris minoris intervenientibus ultra medium dichotomis inde valde arcuatis ut costa media reticulumque pag. inf. optime manifestis; *receptaculis* 7 × 7 mm. binis pedunculatis secus rhachin tenuem rarissime foliatam puberulam dispositis; *pedunculis* minute puberulis receptaculo æquilongis supra medium bracteis parvulis squamiformibus rotundatis onustis; *receptaculi* bracteis internis lanceolato-oblongis obtusis deflexis 2 mm. long.; *florum* ♀ perianthii segmentis 3 lanceolatis acutis obtusisve ·5 mm. long.; *ovario* ovoideo perianthium vix æquante; *stylo* subterminali bicruro.

Mt. Mou; forest; 3000 ft.; serpentine. 584. Branchlets (as also flower-bearing rhachis) 1–1·5 mm. thick. Fruit turning orange-red when ripening. Easily distinguished from *F. Comptonii* by the small leaves and the longer peduncles bracteate near the middle. The perianth is difficult to see, owing to its segments being pressed closely together and against the ovary. Hence the description in that respect may not be accurate.

FICUS OREADUM S. Moore, sp. nov. *Ramulis* tenuibus subtiliter pubescentibus cito glabrescentibus; *stipulis* lanceolatis acuminatis extus microscopice puberulis 7 mm. long.; *foliis* petiolatis (pet. 5–8 mm. long.) ovato-oblongis obtusis vel obtusissimis nonnunquam emarginatis basi rotundatis paullumque obliquis chartaceis glabris 6–8 × 3–3·5 cm. costis lateralibus utrinque 7–8 prope marginem dichotomis necnon arcuatis ut costa media reticulumque pag. utraque eminentibus; *receptaculis* usque 1 × 1 cm. binis sphæroideis ramulis (secundum cl. detectorem itaque sæpe cauli) insidentibus; *pedunculis* abbreviatis (2 mm. long.) infra receptaculum bracteas parvulas squamiformes gerentibus; *receptaculi* bracteis externis late deltoideis acutis obtusisve ·75 mm. long. internis oblongis obtusis 2 mm. long.; *perianthii* fll. ♂ segmentis 3 oblongis obtusis 1·25 mm. long.; *stamine* unico anthera quadrata quam filamentum paullo longiore; *perianthii* fll. ♀ segmentis 4 oblongis obtusis vix 1 mm. long. quam ovarium subglobosum longioribus; *stylo* laterali elongato apice bicruro.

Mont Mou; forest margin; 1000 ft.; serpentine. 468. Banyan, often cauliflorous. In shape the leaves of this are somewhat like those of *F. Proteus* Bur., but unlike them in texture and smoothness.

F. CRETACEA S. Moore, sp. nov. *Frutex* fere biorgyalis; *ramulis* sat tenuibus paucistriatis puberulis; *stipulis* ovatis acuminatis extus subtiliter sericeis 8 mm. long.; *foliis* petiolatis (pet. 1 cm. long.) oblongo-oblanceolatis obtusis raro retusis sub apice sæpe cuspidato-attenuatis basi rotundatis obscureque cordatis pergamaceis glabris 12–18 × 3–5 cm. costa media subtus prominente costis lateralibus utrinque 7–9 uti reticulum mediocriter arctum subtus bene aspectabilibus aperte arcuatis juxta marginem dichotomis; *receptaculis* 11 × 10 mm. solitariis axillaribus breviter pedunculatis subglobosis glabris; *pedunculis* receptaculo brevioribus infra medium bracteatis 5 mm. long.; *receptaculi* bracteis internis obovatis vel oblongo-spathulatis obtusis 1·5 mm. long.; *perianthii* ♀ segmentis 3 ovato-oblongis obtusis rubro-punctatis vix 2 mm. long. achænio late ovoideo paullo longioribus; *stylo* laterali ovario circiter æquilongo.

Mont Mou; moist forest; 800 ft.; cretaceous. 506. Shrub 10 ft. Branchlet of single specimen seen 2·5 mm. thick. In foliage a good deal like some New Caledonian specimens referred by authors, though apparently wrongly, to *F. Webbiana* Miq., but known on sight from these by the longer pedicels to the fruits.

F. CAMPICOLA S. Moore, sp. nov. *Frutex* suborgyalis; *ramis* mediocriter validis cicatricibus foliorum mortuorum clypeiformibus indutis puberulis mox glabris; *stipulis* ovatis acuminatis minute arcteque sericeis vix 1 cm. long.;

foliis petiolatis (pet. 2·5–3·5 cm. long.) basi trinervibus oblongis vel anguste oblongo-obovatis breviter acuminatis apice obtusis basi rotundatis coriaceis 15–16 × 3·5–4·5 cm. supra glabris subtus præsertim in nervis scabriusculo-puberulis costis lateralibus utrinque 8–10 sub margine dichotomis uti costa media reticulumque supra planis subtus bene eminentibus; *receptaculis* 12 × 12 mm. in axillis foliorum binis pedunculatis globosis glabris; *pedunculis* basi bracteatis microscopice puberulis 7 mm. long.; *bracteis* receptaculi externis minutis internis paucis horizontalibus deltoideis acutis obtusisve 1 mm. long.; *perianthii* (♀) segmentis 4 ovatis vel obovatis obtusis vel obtusissimis 1·5–2 mm. long.; *acheniis* ovoideis obtusis stylo persistente laterali apice bicruro comitatis circa 1·5 mm. long.

Plaine des Lacs; *Agathis* forest; 800 ft. 347. Shrub 4 ft. Branch of the only specimen seen 4–5 mm. thick. Near the last, but the broader coriaceous 3-nerved leaves on longer petioles serve to distinguish it at sight.

Pipturus incanus Wedd. Mont Mou; forest margin; 1000 ft.; serpentine. 470. Mt. Canala; forest margin; 1000 ft.; schists. 1174. Tree 25-30 ft. Indian Archipelago, Polynesia.

P. albidus A. Gray. Ignambi; forest; 2000 ft.; gneiss. 1645 Mt. Panié; forest clearing; 1500 ft.; gneiss. 1802. Tonine; forest; 2000 ft.; hornblende. 1963. Sandwich Islands.

Boehmeria acuminata Wedd. Paompai; forest margin and clearing; 200 ft. 1868. This has been distributed by Schlechter (*sub. no.* 15511) as "*Cypholophus heterophyllus* Wedd."

CASUARINACEÆ.

Casuarina Cunninghamiana Miq. Nouméa; road to Anse Vata. 62. River Dumbéa; abundant along stream-banks. 409, 820. Mt. Mou; frequent in Niaouli zone; scattered or often forming local societies; 600–800 ft. 604. Mont Dore; characteristic of stream-valleys in low serpentine hills below 300 ft. 665. Taom; forms extensive pure woods on serpentine plain; 200 ft.; especially towards streams. 2288. Tree 30–40 ft. Very hard wood. Queensland and New South Wales.

C. equisetifolia Forst., var. incana Poiss. Port Ngéa; Nouméa; border of littoral. 28. Tree of about 25 ft., graceful weeping habit. Tropical Africa through tropical Asia and the Archipelago to Australia and Polynesia.

C. nodiflora Forst. River Comboui; streamside; serpentine alluvium; 50 ft. 2225. Tree 30 ft. Branches weeping, greyish green. Polynesia.

C. Deplancheana Miq. Plaine des Lacs; abundant on moderate serpentine slopes; associated with *Dacrydium araucarioides* and resembling it in its candelabrum form. 307. River Dumbéa; common in flood plains and on river banks; 100 ft.; serpentine. 417. Kuakué; abundant in scrubby forest on dry hillsides; up to 800 ft. 942. Nekando; open serpentine ridges; 2000 ft.; with *Dacrydium araucarioides*. 2124. Tree from 15–30 ft. (occasionally more). Wood hard.

CASUARINA POISSONIANA Schlechter. Mts. to N.W. of River Ngoyé; frequent in scrubby woods at low levels; at higher altitudes forms dense forests in which it is dominant; 0–3000 ft.; serpentine. 994. River Ngoyé; dominant over large areas; replacing *Spermolepis gummifera*; also along river margin; 0–2000 ft. 2046. Mts. to north of Ngoyé; forming dense forests; 1000–3000 ft.; serpentine. 2070. Tall tree reaching 60–70 ft. Candelabrum shape.

C. ANGULATA Poiss. River Tchiem; abundant and characteristic of open parts of river course; 0–100 ft. 1998. Tree 40 ft.

C. CHAMÆCYPARIS Poiss. Kuakué; occasional in flood-plains of river; 50 ft.; serpentine. 926. Cap Bocage; forming small local societies in mica schists; 200 ft. 1390. River Comboui; scrubby woods and *Callitris* association by river side; 100 ft. 2009. Taom; abundant in riverside pebble association, forests, and on low serpentine hills below 1000 ft. 2322. Small cypress-like tree, 15–30 ft.

To be inserted on p. 356 after *Symplocos callophylloides*.

S. (§ Bobua) MUNDA S. Moore, sp. nov. *Frutex* ultrametralis ramosus glaber; *ramulis* longitrorsum striatis cinereis sursum foliosis; *foliis* petiolatis (pet. 5 mm. long.) ovatis apice subito obtusatis raro rotundatissimis basi cuneatis margine leviter revolutis coriaceis pallide nitidis in sicco læte lutescenti-viridibus 4–5 × 2–2·5 cm. costa media supra impressa subtus eminente costis lateralibus utrinque 4 pag. utravis parum aspectabilibus; *spicis* axillaribus plurifloris ± 1·5 cm. long.; *bracteolis* ovatis obtusis margine ciliolatis 1·2 mm. long.; *calycis* lobis tubum adæquantibus suborbiculatis 1·25 mm. long.; *corollæ* alte divisæ lobis 5 suborbicularibus albis 4 mm. long.; *staminibus* ultra 30 filamentis corollæ lobis nunc æquilongis nunc plane brevioribus; *ovario* uti stylus glabro hic 1·5 mm. long.

Canala, occasional in slightly sheltered serpentine scrub; 1338.

To be inserted in the genus next *S. montana* Brongn. & Gris, differing *inter alia* in the shape and size of the leaves, the considerably larger flowers with longer ovary and calyx-lobes, and the longer and broader lobes of the corolla.

DESCRIPTION OF THE PLATES.

Plate **13**. 1–4. *Acianthus.* 1. *A. bracteatus* Rendle, nat. size. 2. *A. corniculatus* Rendle, column of flower, side view, with front view of appendage above, ×5. 3. *A. nanus* Rendle, nat. size. 4. *A. culiciferus* Rendle, nat. size. 5–7. *Phajus neocaledonicus* Rendle. 5. Flower, nat. size. 6. Lip flattened, nat. size. 7. Column, ×1½. 8. Flower of *Calanthe neocaledonica* Rendle, nat. size. 9. Flower of *C. oreadum* Rendle, nat. size. 10. *Phreatia Comptonii* Rendle. 11. Flower of same, ×16. 12. Lip of flower, ×16. 13. Flower of *Dendrobium Comptonii* Rendle, nat. size.

Plate **14**. *Campynema neocaledonicum* Rendle. 1. Plant, nat. size. 2. Opening flower, ×3. 3. Expanded flower, the stigmas have not yet spread, ×3. 4. Front and 5. back view of a stamen, ×15. 6. Fruit, ×3. 7. Same in vertical section, ×3. 8. Transverse section of 7, cut at × ×. 9. Seed, ×8.

Plate **15**. 1–6. *Comptonella* Bak. fil. 1. Portion of plant, nat. size. 2. Flowers, ×4. 3. Flower, ×8. 4. Longitudinal section of ovary, ×8. 5. Transverse section of ovary, ×8. 6. Fruit, ×4. 7–9. *Montagueia* Bak. fil. 7. Portion of inflorescence, nat. size. 8. Bud, ×8. 9. Flower, ×8.

Plate **16**. 1–5. *Sphenostemon Comptonii* Bak. fil. 1. Portion of branch, nat. size. 2. Ground-plan of flower. 3. Flower with portion of calyx and corolla removed, ×4. 4. Stamens, ×4. 5. Longitudinal section of ovary, ×6. 6–11. *Microsemma Comptonii* Bak. fil. 6. Portion of branch, nat. size. 7. Ground-plan of flower. 8. Flower showing ovary, ×2. 9. Flower with portion of calyx and corolla removed, ×3. 10. Longitudinal section of ovary, ×6. 11. Transverse section of ovary, ×6.

Plate **17**. *Salaciopsis* Bak. fil. 1. Portion of branch, nat. size. 2. Flower, ×4. 3. Female flower with portion of calyx and corolla removed, ×4. 4. Longitudinal section of ovary, ×4. 5. Male flower, ×3. 6. Stamen, ×4.

Plate **18**. *Paracryphia* Bak. fil. 1. Portion of branch, nat. size. 2. Flower, × 3. 3. Flower with part of perianth removed, ×6. 4. Stamens, ×6. 5. Ovary, ×6. 6. Transverse section of ovary, ×9. 7. Fruit, nat. size. 8. Single carpel, ×2.

Plate **19**. *Enochoria* Bak. fil. 1. Leaf, ⅓ nat. size. 2. Portion of inflorescence, ⅓ nat. size. 3. Flowers, ×3. 4. Female flower, ×8. 5. Longitudinal section of two ovaries, ×8. 6. Transverse section of ovary, ×6.

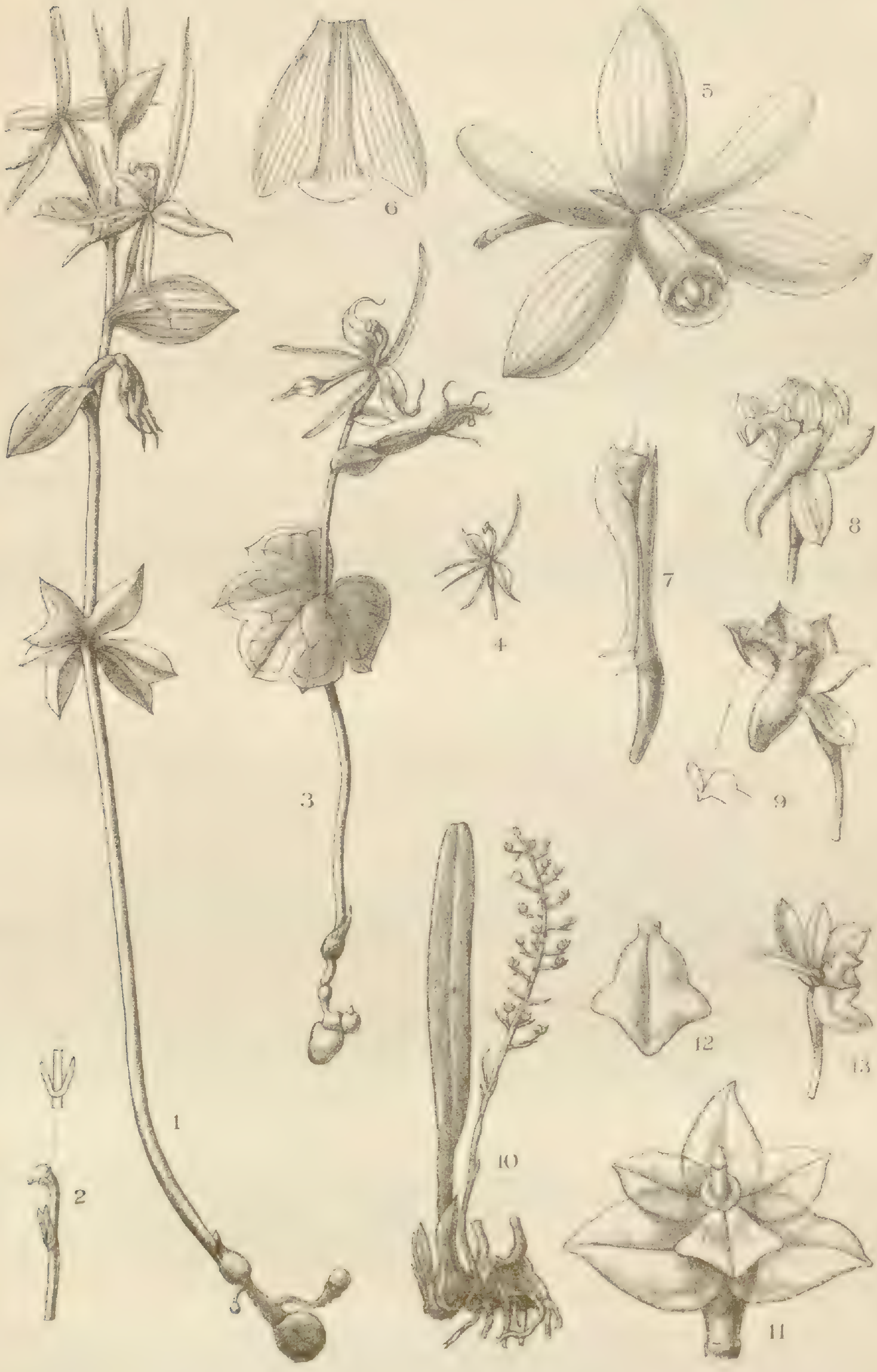
Plate **20**. *Merismostigma neocaledonicum* S. Moore. 1. Branch, nat. size. 2. Corolla opened, ×3. 3. Ovary in longitudinal section showing the two pendulous ovules, ×4.

Plate **21**. 1–7. *Tropalanthe Sealyæ* S. Moore. 1. Leaf, ⅔ nat. size. 2. Branch bearing flowers, nat. size. 3. Flower-bud, nat. size. 4. Corolla and stamens, nat. size. 5. Part of opened corolla, nat. size. 6. Stamen, ×3. 7. Ovary in transverse section, ×4. 8–11. *Trimenia neocaledonica* Bak. fil. 8. Flower, ×6. 9. Same opened, ×6. 10. Ovary opened longitudinally, ×6. 11. Same in transverse section, ×6.

Plate 22. *Pterochrosia.* 1–6. *Pt. Comptonii* S. Moore. 1. Branch, nat. size. 2. Corolla opened, ×2. 3. Stamen, ×8. 4. Gynœcium, ×9. 5. Carpel opened from the back to show the two ovules, ×9. 6. Samara in transverse section showing a seed and the two wings, nat. size. 7. *Pt. Vieillardi* Baill. Samara, nat. size.

Plate 23. *Depanthus glaber* S. Moore. 1. Branch, nat. size. 2. Corolla opened showing the five stamens and gynœcium, ×2. 3. Anther, ×6. 4. Same, one of the cells removed, ×6. 5. Ovary in transverse section, ×8. 6. Ripe capsule, nat. size. 7. Same, showing the separated valves, nat. size.

Plate 24. 1–5. *Adenodaphne corifolia* S. Moore. 1. Branch, nat. size. 2. Male flower in longitudinal section, ×6. 3-5. Stamens from the three whorls, ×10. 6–11. *Dendrophyllanthus Comptonii* S. Moore. 6. Male and 7. female branch, nat. size. 8. Male flower, ×4. 9. The three stamens drawn apart, ×7. 10. Single stamen seen from outside, ×8. 11. Showing column left by dehiscence of capsule, *p.* one of the persistent petals, ×7.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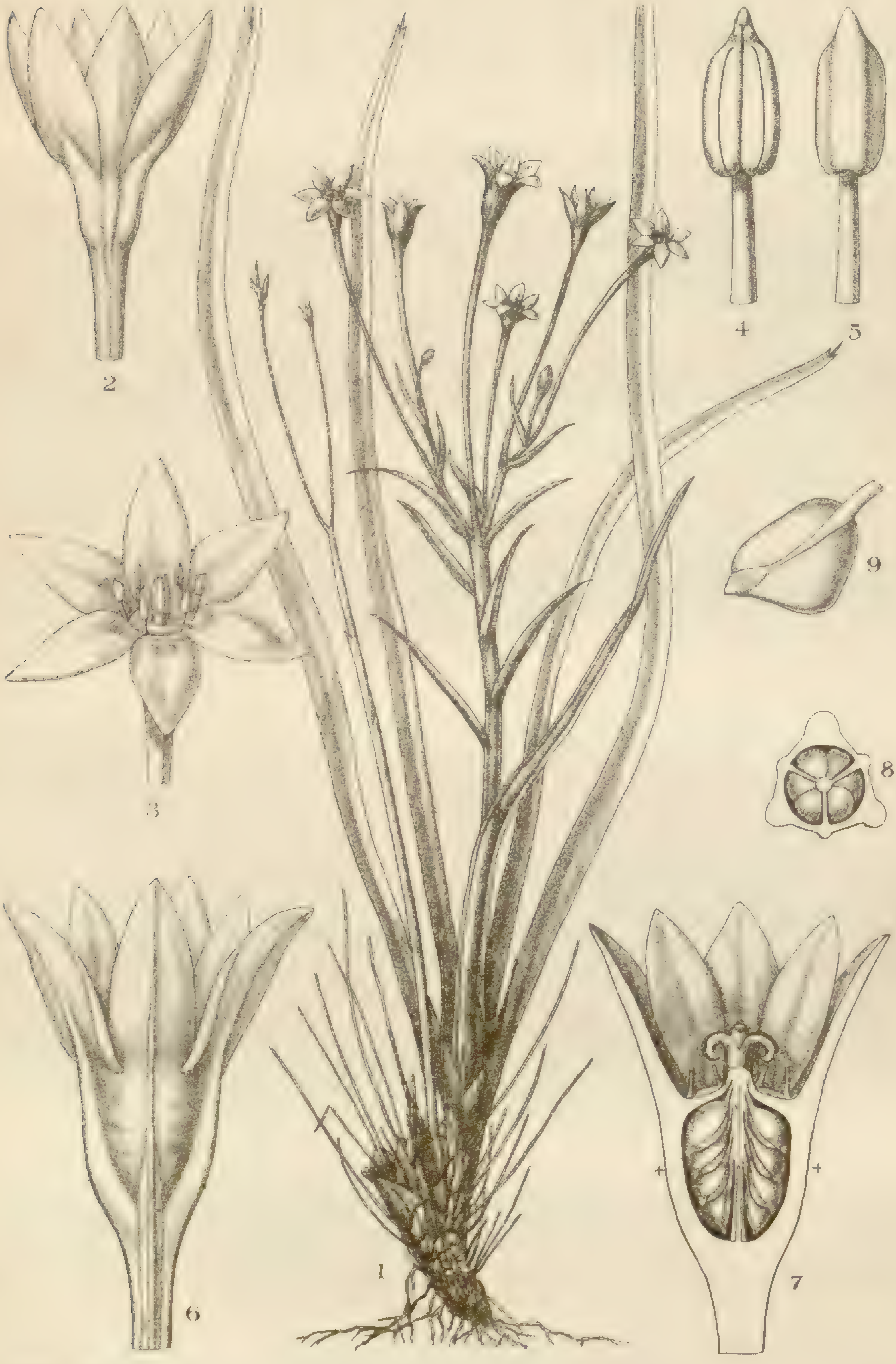
A.B. Rendle anal.
P. Highley del & lith.

C. Hodges & Son, imp.

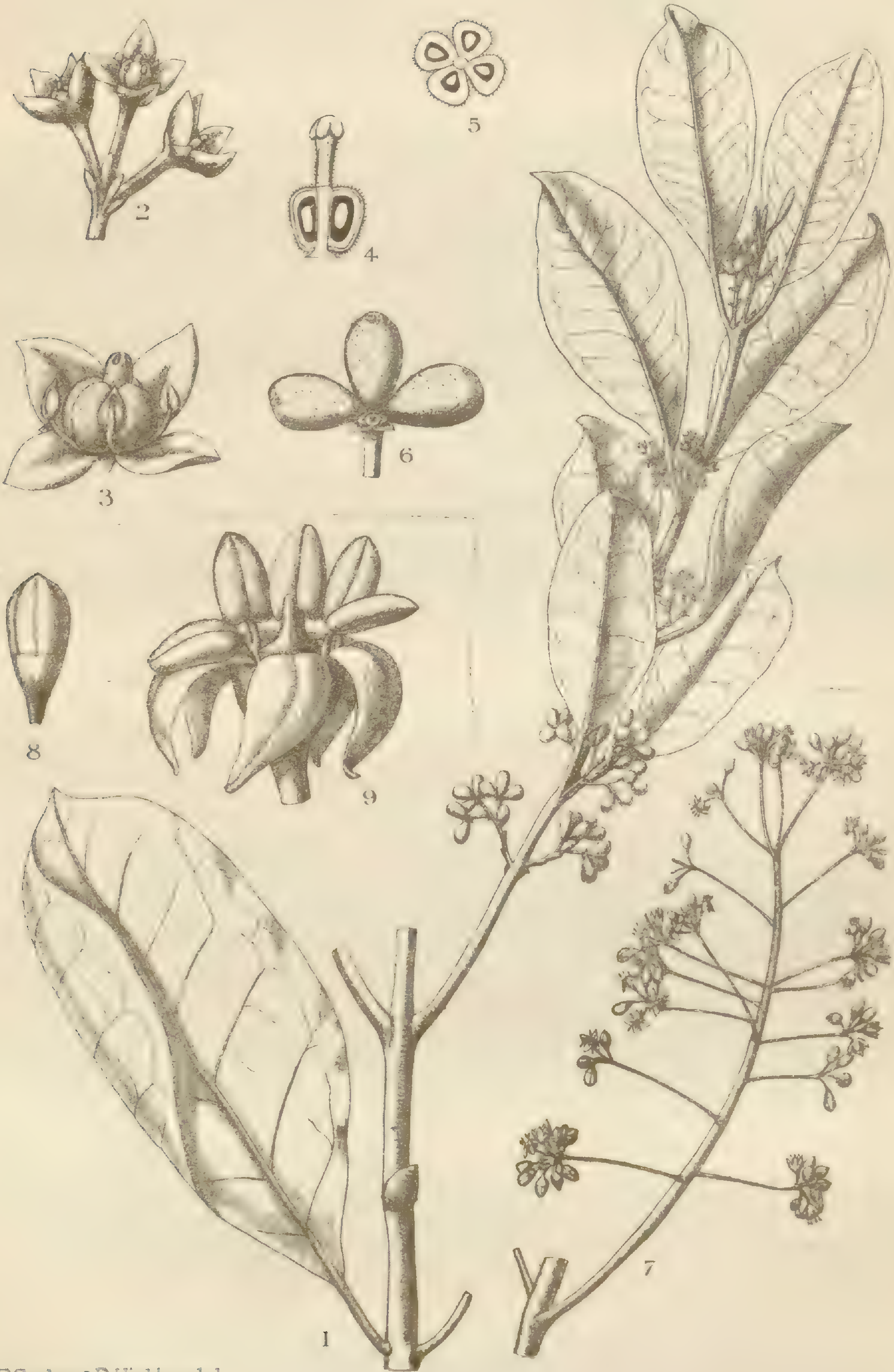
ORCHIDS from NEW CALEDONIA.



A.B. Rendle anal.
P. Highley del & lith.
C. Hodges & Son, imp.

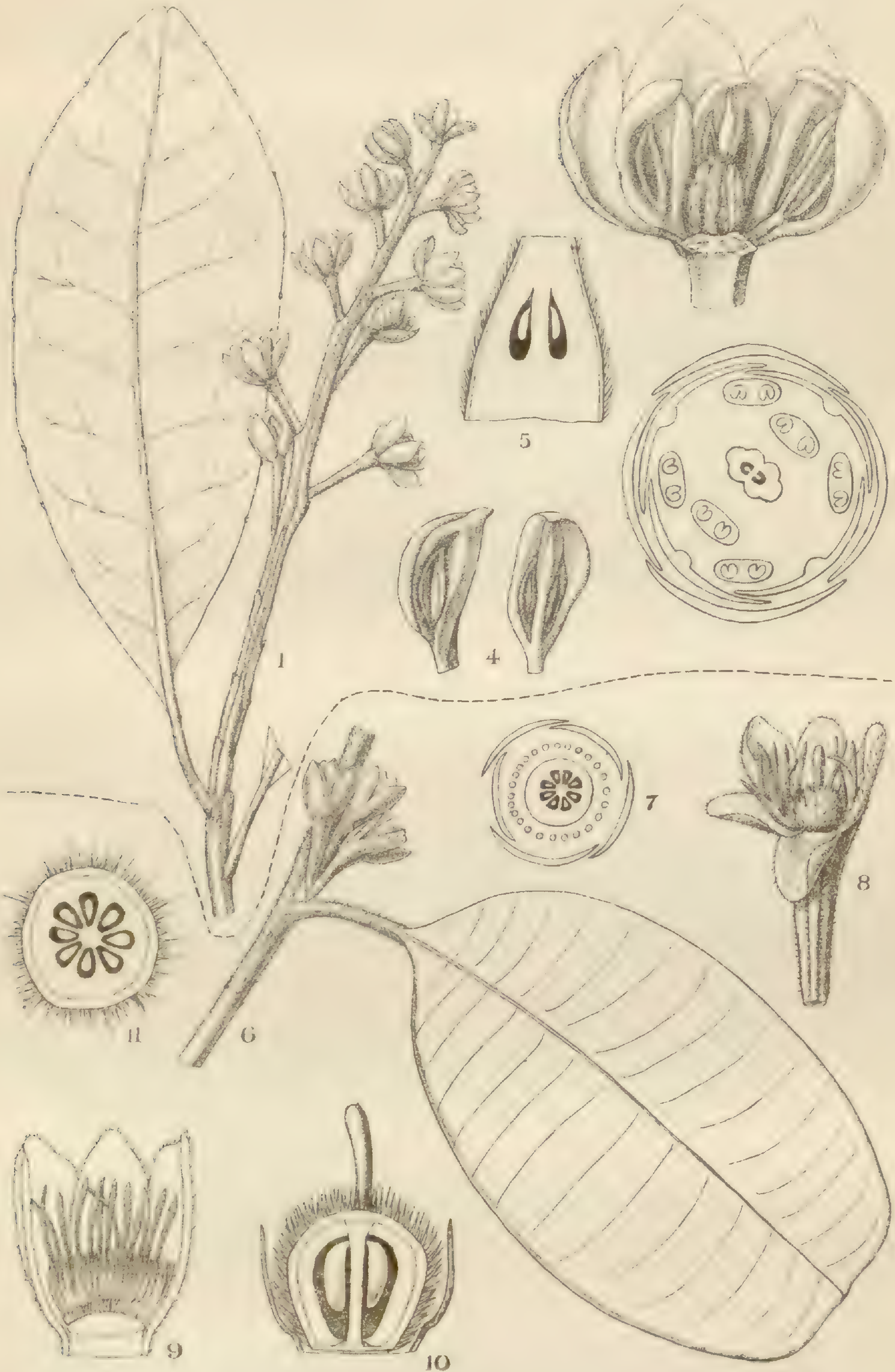
CAMPYNEMA NEOCALEDONICUM Rendle.

E.G.Baker. JOURN. LINN. SOC. BOT. VOL. XLV. PL. 15.



R.Cardew & P.Highley del.
P.Highley lith.
C.Hodges & Son, imp.

1-6, COMPTONELLA: 7-9, MONTAGUEIA.

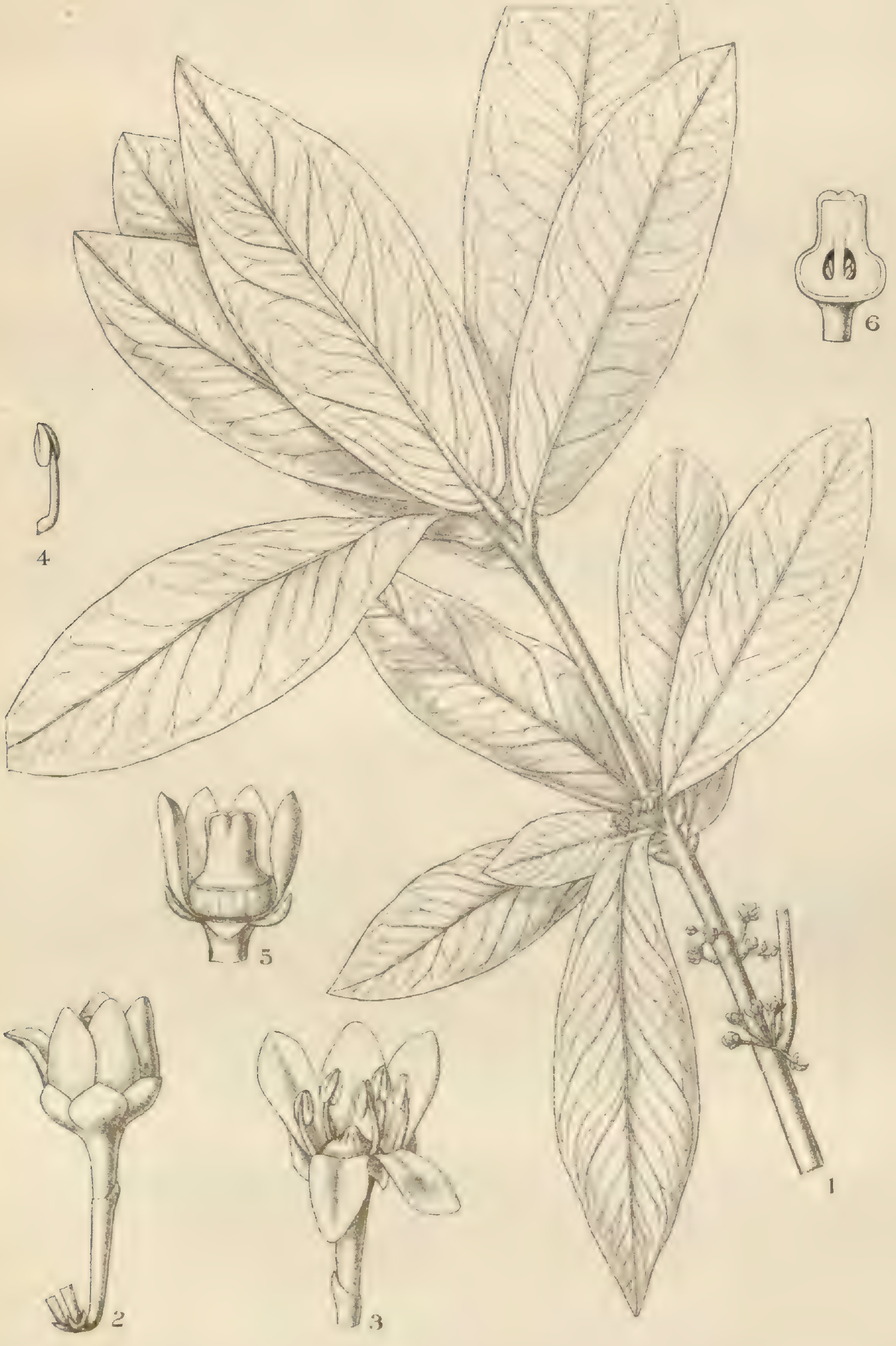


R. Cardew del
P. Highley lith.

C. Hodges & Son, imp.

1-5, SPHENOSTEMON COMPTONII Bak. fil.

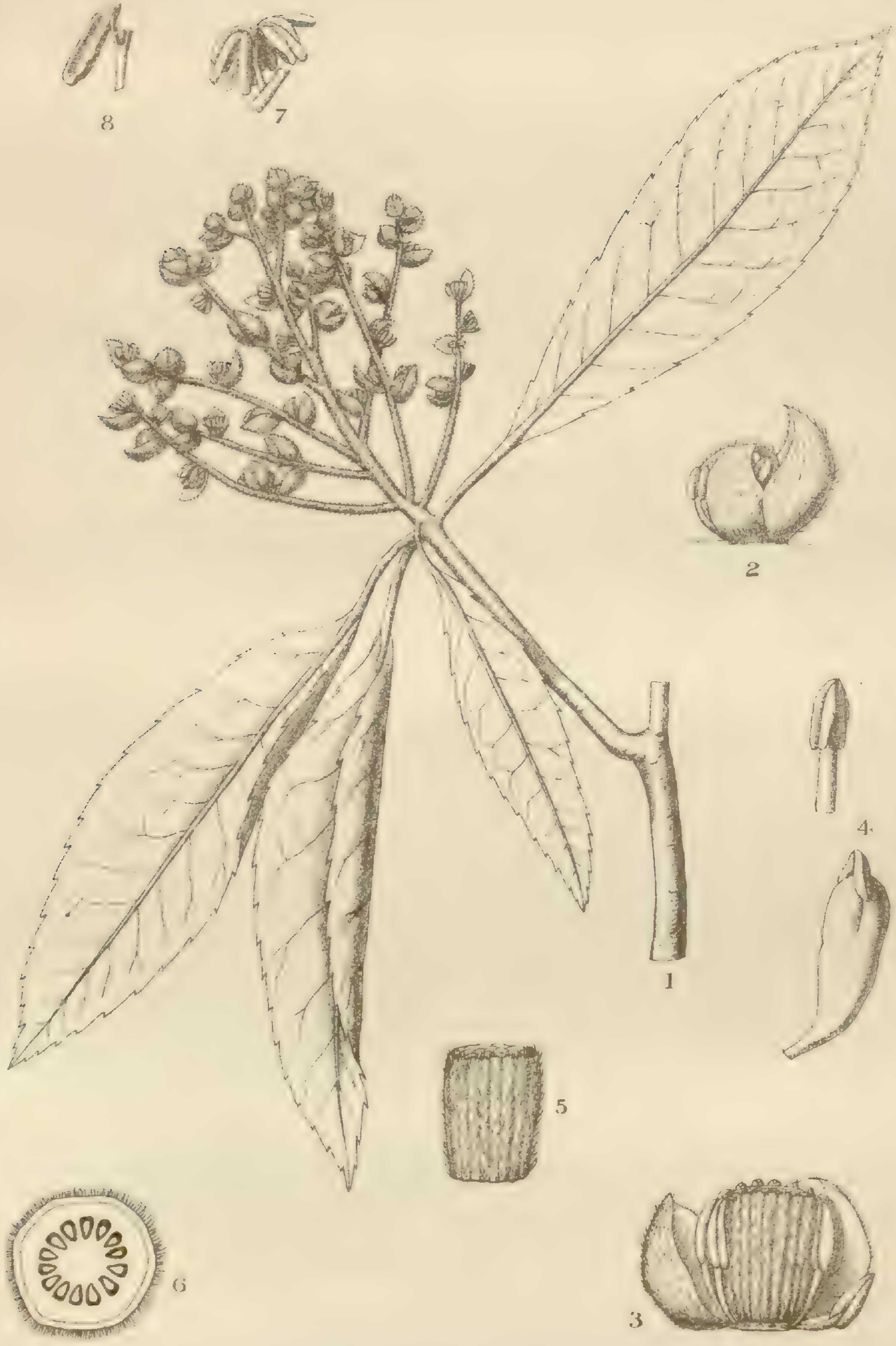
6-11, MICROSEMMA COMPTONII Bak. fil.



R. Cardew del.
P. Highley lith.
C. Hodges & Son, imp.

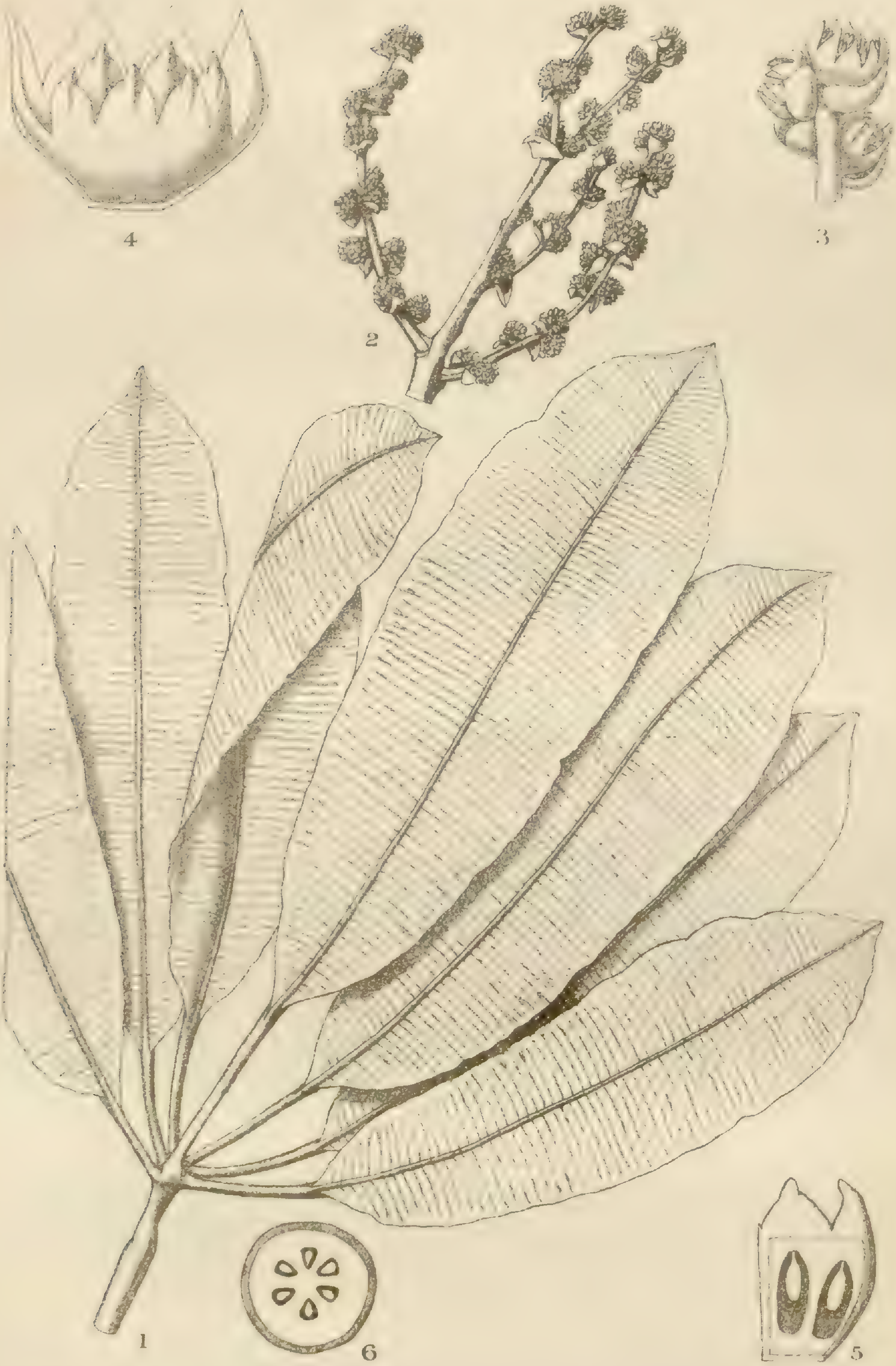
SALACIOPSIS NEOCALEDONICA Bak. fil.

E. G. Baker.



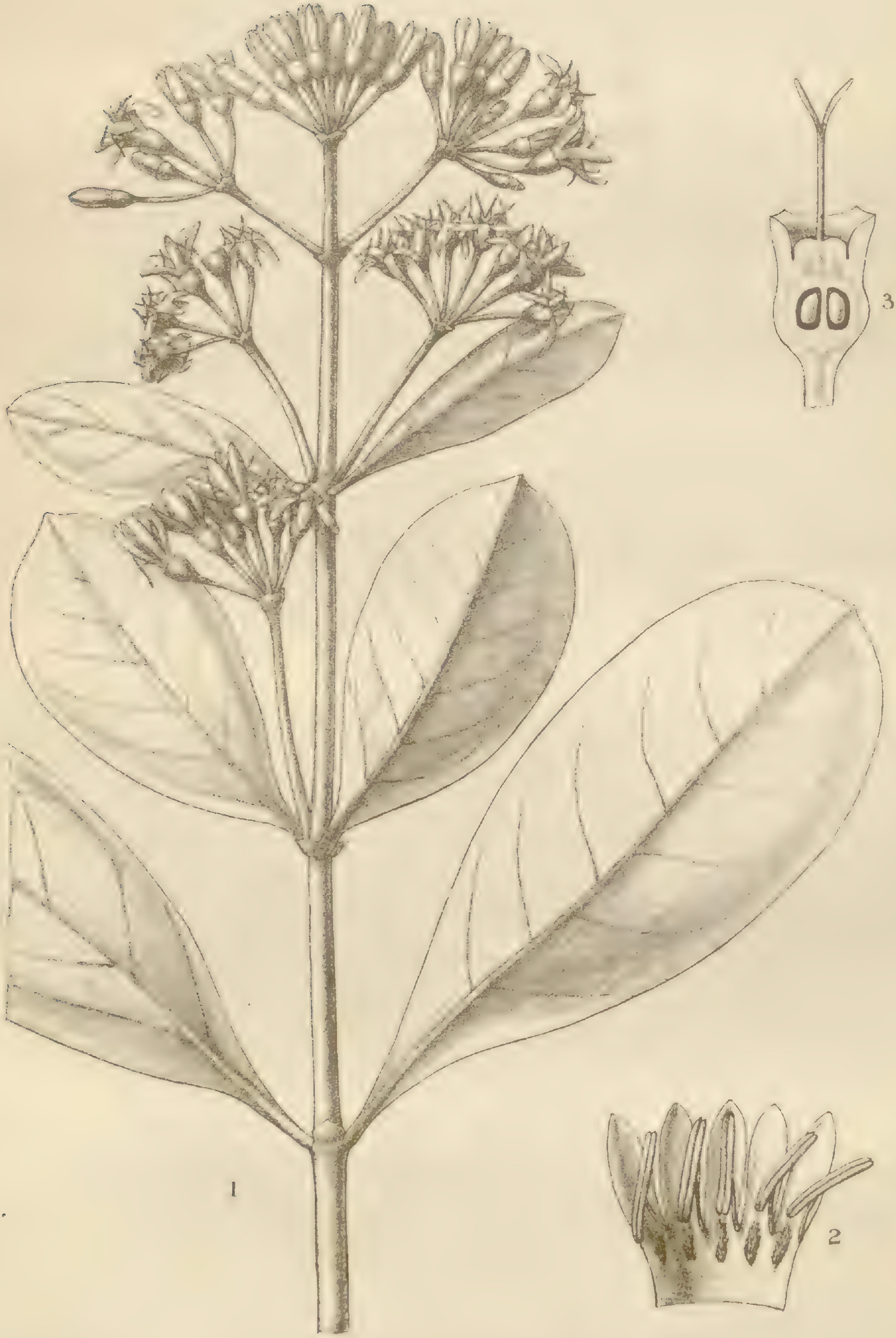
R. Cardew del.
P. Highley lith.
C. Hodges & Son imp.

PARACRYPHIA SUAVEOLENS Bak. fil.



R. Cardew del.
P. Highley lith.
C. Hodges & Son imp.

ENOCHORIA SYLVICOLA Bak. fil.



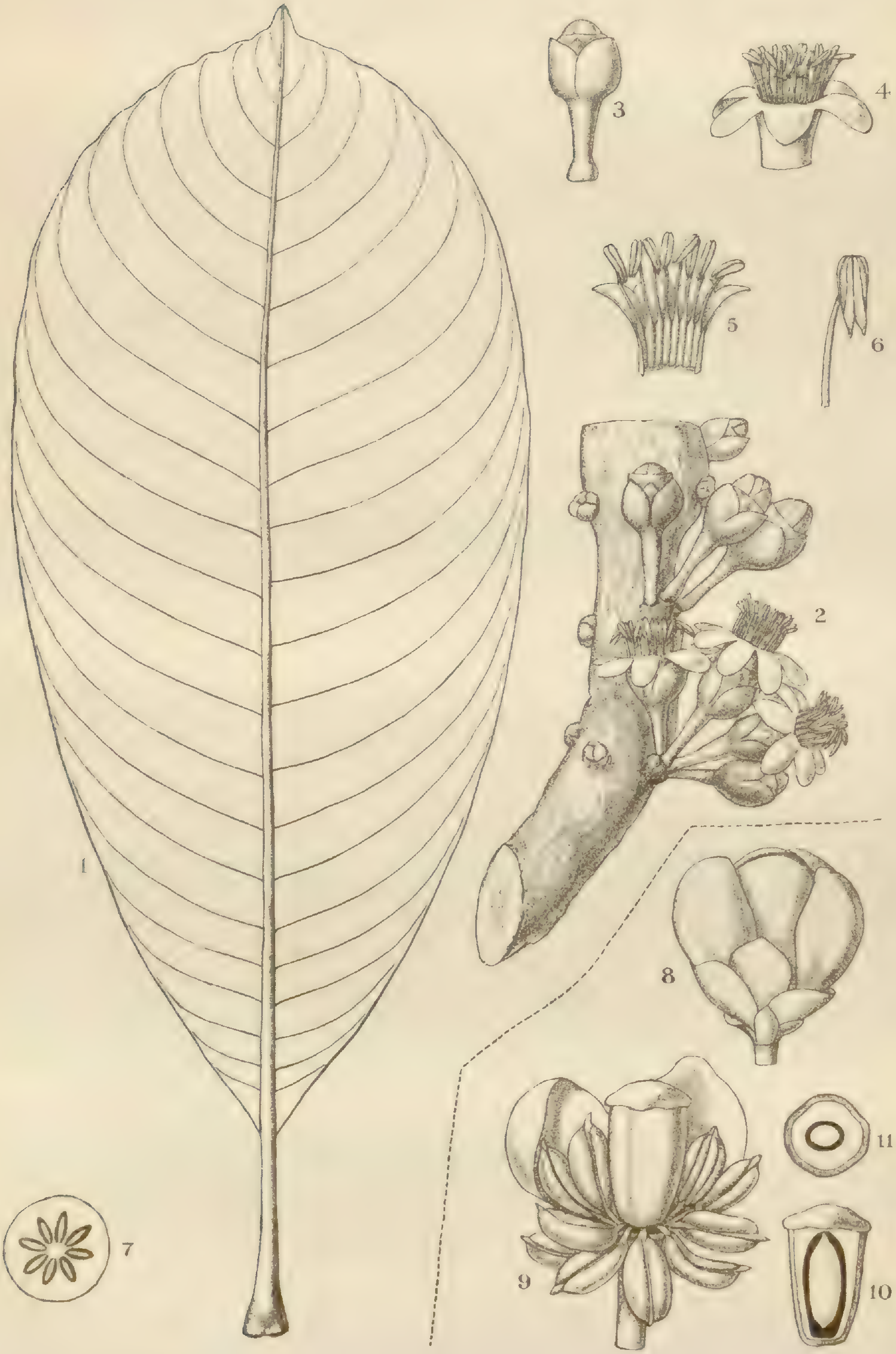
S. Moore anal.
P. Highley lith.

C. Hodges & Son, imp.

MERISMOSTIGMA NEOCALEDONICUM S. Moore

Moore.

Journ. Linn. Soc. Bot. Vol. XLV. Pl. 21.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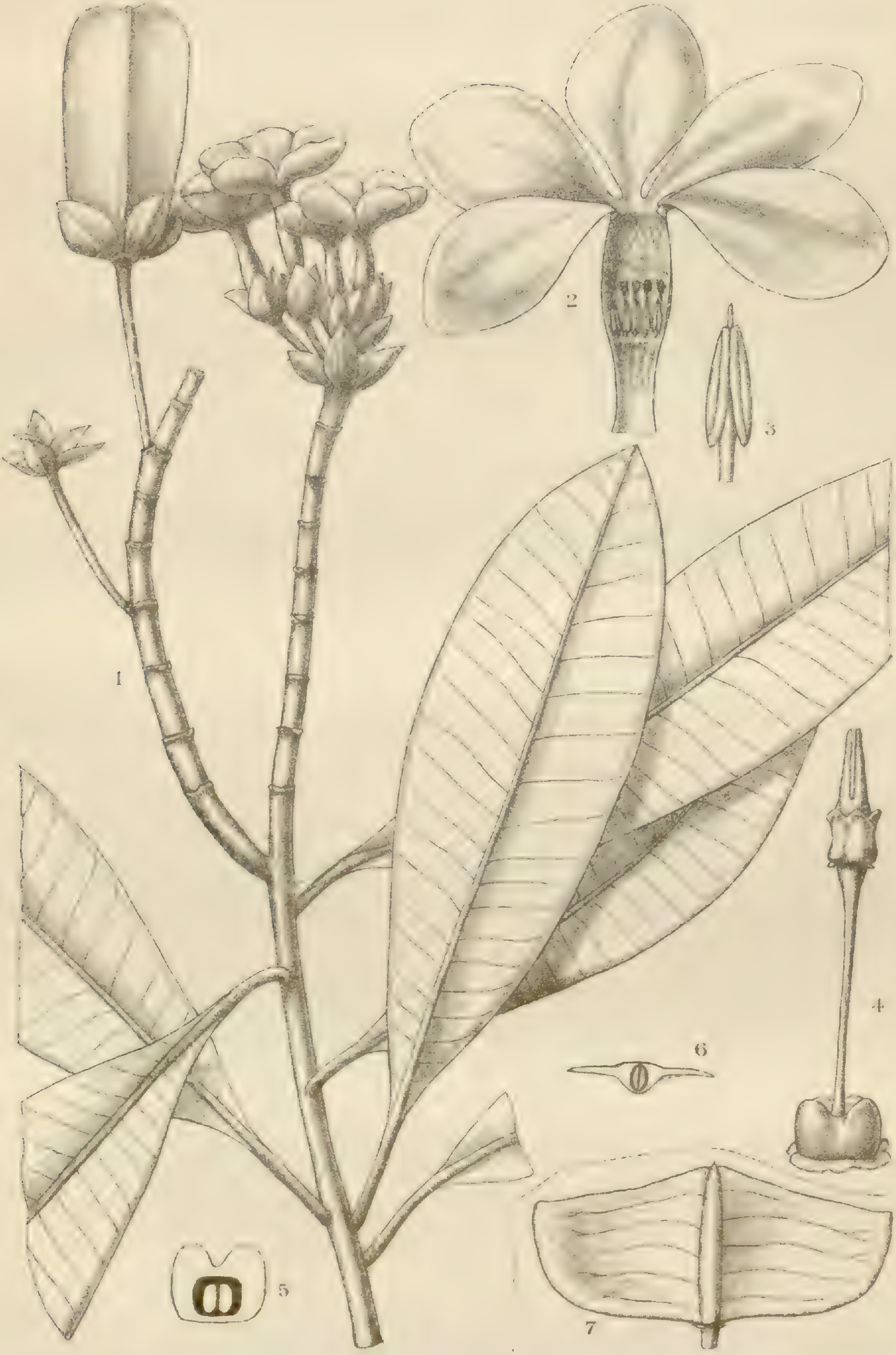
R. Cardew & S. Moore anal.
P. Highley lith.
C. Hodges & Son, imp.

1-7, TROPALANTHE. 8-11, TRIMENIA.

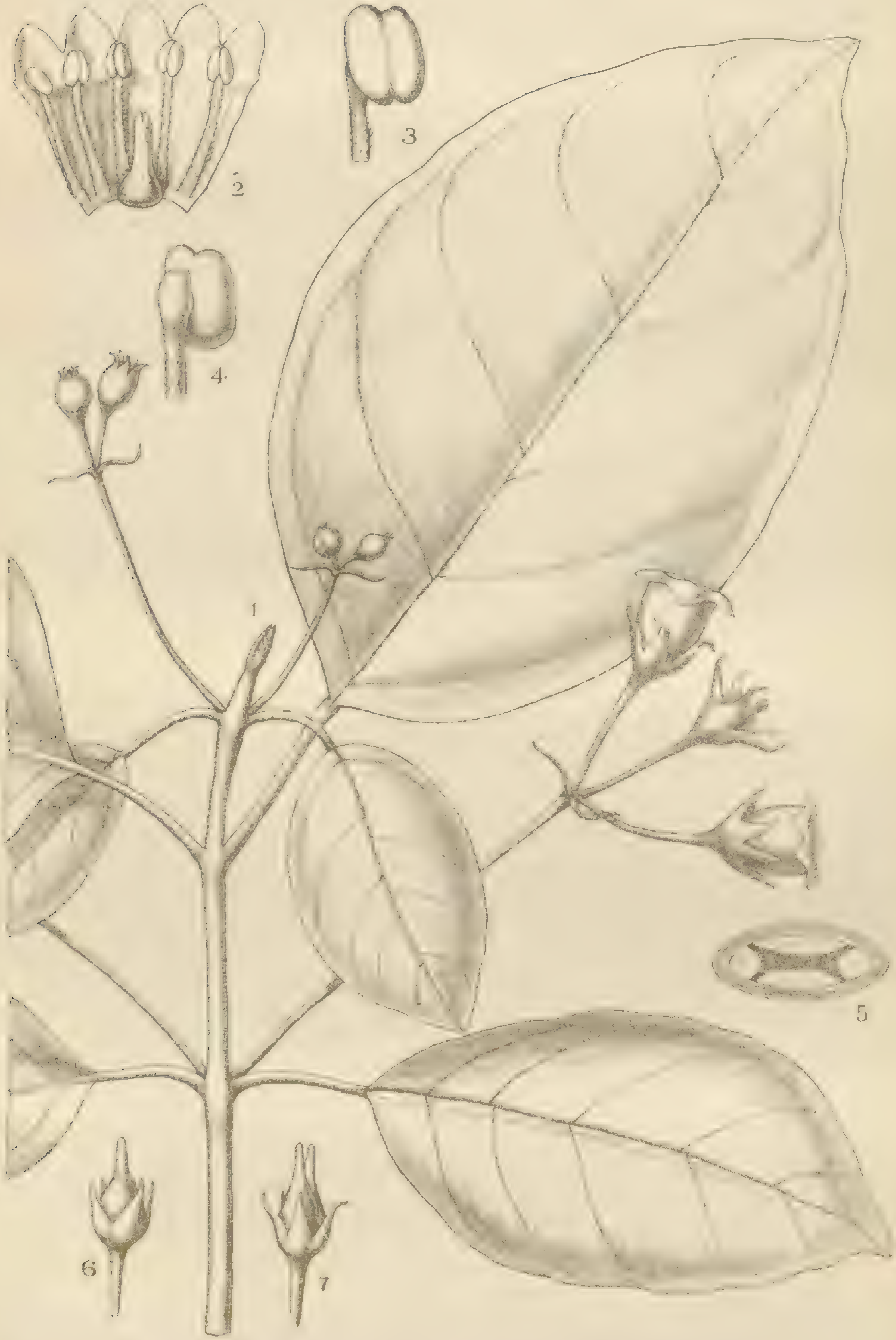
Journ. Linn. Soc. Bot. Vol. XLV. Pl. 22.



S. Moore anal.
P. Highley lith.

C. Hodges & Son, imp.

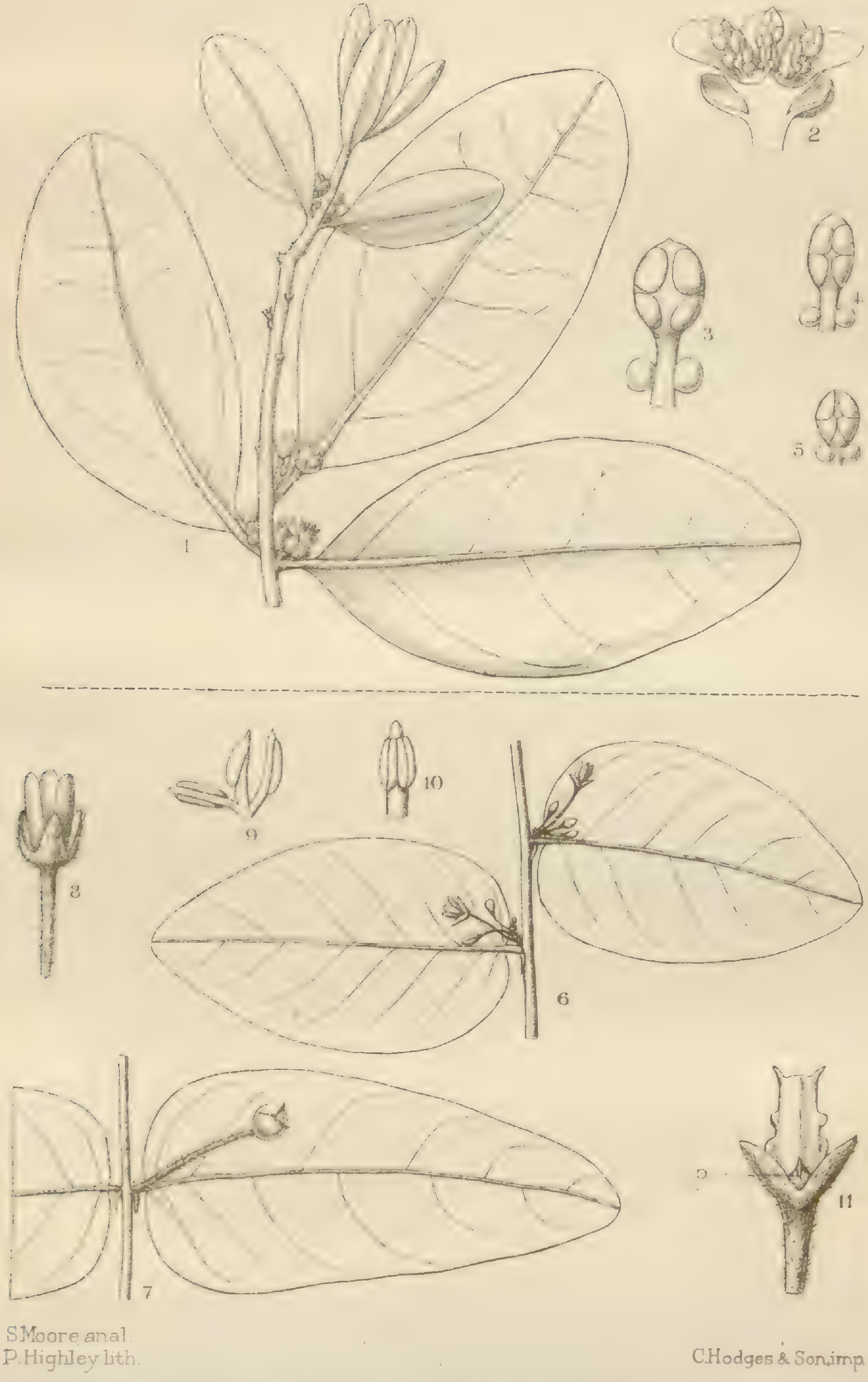
PTEROCHROSIA.



S. Moore anal.
T. Highley lith.

[illegible] imp.

DEPANTHUS GLABER S. Moore.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S. Moore anal.
P. Highley lith.
C. Hodges & Son, imp.

1-5, ADENODAPHNE. 6-11, DENDROPHYLLANTHUS.

Contribution to the Teratology of the Genus *Datura* L.

By JOHN BAPT. DE TONI, For.M.L.S., F.R.M.S.

(PLATE 25.)

[Read 17th February, 1921.]

MANY examples of monstrosities and anomalies in the species of the Solanaceous genus *Datura* L. are described in the ordinary text-books of Teratology [*], and it is known that some species—namely, *Datura arborea* L., *D. ceratocaula* Jacq., *D. chlorantha* Hook., *D. cornigera* Hook., *D. fastuosa* L., *D. Knightii* hort., *D. humilis* Desf. (=*fastuosa* L.)—show a tendency to produce more or less abnormal double flowers, a peculiar tendency which can be explained in various ways, according to Masters: by pleiotaxy of the corolla, or by a series of confluent petalodic stamens, or by adventitious growth on the outside of the corolla. Other species, as *Datura Metel* L., *D. quercifolia* H. B. et K., and *D. Stramonium* L., show interesting abnormalities, particularly in the development of the corolla or of the andrœcium and gynœcium; these have been illustrated in the works of Wydler, A. P. de Candolle, Jaeger, Clos, Schlechtendal, Dedecek, Godron, and Moquin-Tandon, which are enumerated by Penzig [†].

In the past year I have discovered some cases of monstrosities which are quite new for the genus *Datura*, as my learned colleague and specialist in this matter, Prof. O. Penzig, was so kind as to attest in a personal letter [‡].

In the Botanical Garden at Modena a specimen of the common *Datura* (*D. Stramonium*) has flowered irregularly. The first flowers in the lower region of the plant were normally developed and reached maturity, giving rise to perfect capsules containing numerous fertile seeds; on the contrary, the upper and latest (in October) developed floral buds have given rise to an unusual and very strange form. The calyx, which in this species commonly assumes an elongated tubular—almost pentagonal—prismatic form, appears in the monstrous flower as if formed by the fusion of 4 or 5 more or less enlarged, unequal dark green leaves, corresponding in number with the calyx-teeth, and the calyx was so much inflated that it recalled, in some specimens, the enlarged ventricose calyx of *Physalis*, a member of the same family *.

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[*] Masters, M. T., "Vegetable Teratology, an Account of the principal Deviations from the usual Construction of Plants," London, 1869; Penzig, O., "Pflanzen-Teratologie systematisch geordnet," vol. ii., Genua, 1894.

[†] Penzig, O., *op. cit.*, p. 176. For other monstrosities (pistillody) of *Datura Stramonium* L., see Savelli R., "Contribuzione allo studio della pistillodia ovulare" (Annali di Botanica, vol. xv. Fasc. i.), Rome, 1920.

[‡] One similar case is only but briefly described for *Datura Stramonium* var. *Tatula* by C. Massalongo, "Nuova Miscellanea Teratologica" (Nuovo Giornale Botanico Italiano, N.S., vol. iii. N. 2, Firenze, 1896).

The corolla, which in the normal flowers attains a considerable size, is in the abnormal flowers quite wanting; in place of this floral envelope I have often observed some very small green phyllomes or leaflets, which are inserted in almost cross directions.

In the majority of these teratological flowers the sexual organs are often likewise wanting; in some cases a remarkable reduction of those organs is seen. The andrœcium shows rudimental, almost sessile, anthers, the pollen being quite undeveloped, while the gynœcium consists of a very small ovarium with two hardly distinguishable cavities, without any trace of ovules. I propose to investigate next season if these singular abnormalities are hereditary, as is the case in numerous other plants—for instance, the monstrous foxglove †.

It seems to me that similar anomalous formations confirm Delpino's doctrine of idiomorphosis ‡, according to which phyllomatic traces or primordia can arise independently in different places; and it is not necessary to admit that a trace, normally destined to give rise to a corolla or to other organs, must necessarily produce those organs, and not leaves or other appendicular members of the caulomes.

Explanation of Plate 25.

Fig. 1 *a*. Branch bearing a monstrous flower.
1 *b*. The same with calyx cut open and displayed.
2 *a*, 3 *a*, 4 *a*. Three examples of a monstrous flower.
2 *b*, 3 *b*, 4 *b*. The same with calyx opened and displayed.
6 *a*, 6 *b*. Monstrous flower, the second figure in outline indicating the rudimentary ovary enclosed.

All about natural size. (Fig. 5 has been omitted.)

Modena Royal Botanical Garden of the University,
31st December, 1920.

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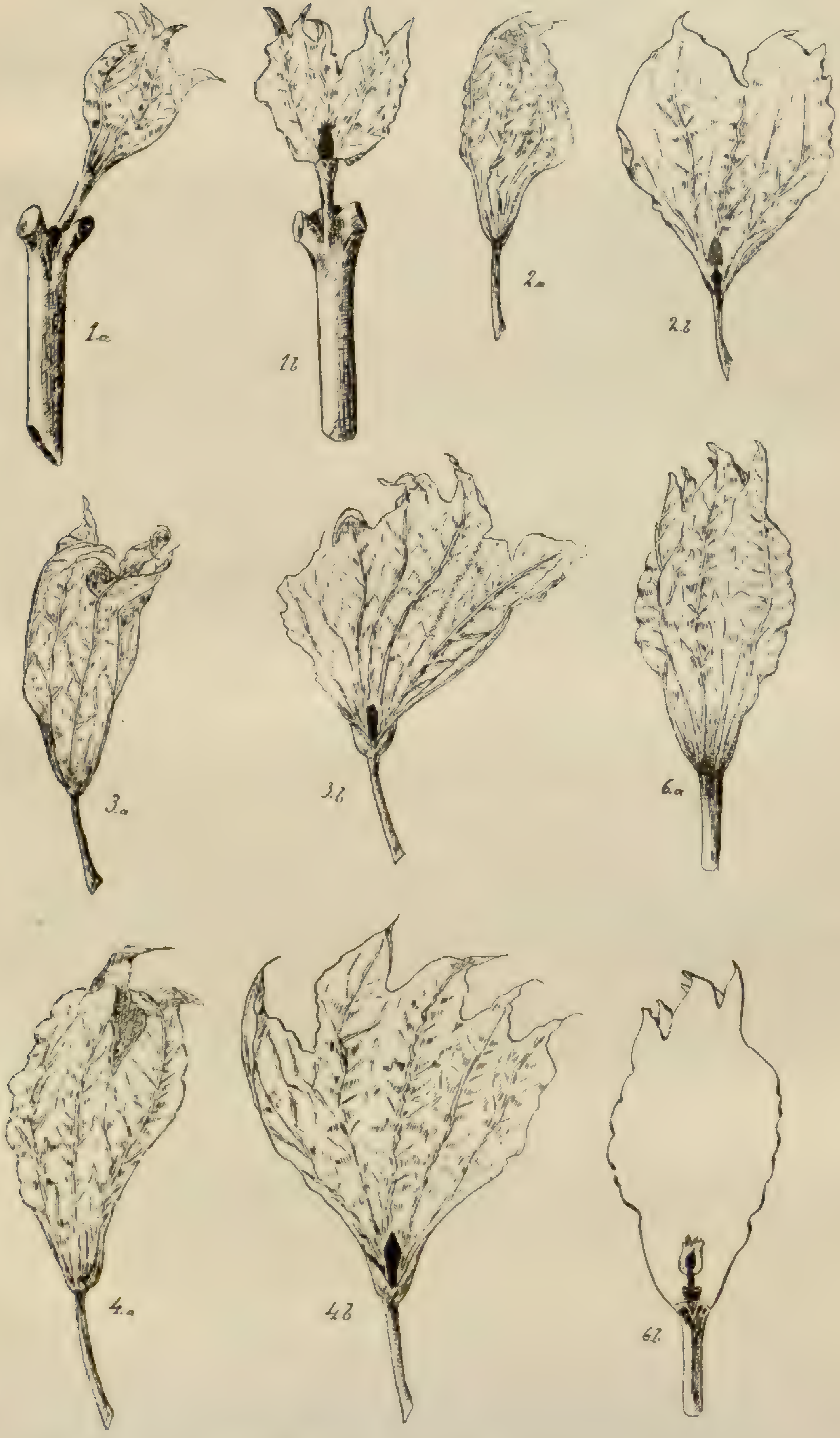
* In the genus *Hyoscyamus* similar malformations are known. In *Hyoscyamus albus* L. rudimental flowers reduced to a single well-developed calyx were described by Clos, "Essai de Tératologie taxinomique, ou des anomalies végétales considérées dans leurs rapports avec les divers degrés de la classification," p. 35 (Mém. Acad. Sc. de Toulouse, 3 sér., T. iii.); in another species, *Hyoscyamus niger* L., terminal flowers with only empty calyx were noted by F. Ludwig, "Weitere biologische Mittheilungen," p. 89 ('Botanisches Centralblatt,' viii. no. 42, Cassel, 1881).

† De Toni, G. B., "Nuove osservazioni di teratologia fiorale nella *Digitalis purpurea* L." (Atti del R. Istituto Veneto di Scienze, Lettere ed Arti, T. lxxvi. 2, pp. 789–836, 1 coloured plate, Venezia, 1917).

‡ Delpino, F., "Pensieri sulla metamorfosi e sulla idiomorfosi presso le piante vascolari" (Memorie della R. Accademia delle Scienze, ser. v. T. ii. pp. 101–117, Bologna, 1892).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MONSTROUS DATURA FLOWER.

A Systematic Account of the Plants collected in New Caledonia and the Isle of Pines by Mr. R. H. Compton, M.A., in 1914.—PART II. Gymnosperms and Cryptogams. By Prof. COMPTON and others. (Communicated by Dr. A. B. RENDLE, F.R.S., Sec.L.S.)

(PLATES **26**, **27**.)

[Read 4th March, 1920.]

GYMNOSPERMS.

By R. H. COMPTON.

THE Gnetales and Ginkgoales are absent from New Caledonia. The Cycadales are represented by a single species, which occurs only in the littoral zone, and is of wide distribution throughout the Indo-Malay region and Polynesia.

The Coniferales, on the other hand, are developed to a quite exceptional degree, members of all the sub-families except the Phyllocladoideæ, Abieteæ, and Taxodieæ being present. The Araucarieæ include five native species of *Araucaria* (§ Eutacta) and three of *Agathis*. The Podocarpeæ are represented by four species of *Dacrydium*, eight or nine of *Podocarpus*, and one of *Acmopyle*. The range of the Taxeæ is now extended to New Caledonia by the new genus *Austrotaxus*. The Cupresseæ include a *Libocedrus*, a *Callitris* (with a variety), and the new genus *Callitropsis*.

In all, my collection comprises 26 or 27 native Conifers. Guillaumin (1911) catalogues 28 distinct species, some of which, however, are doubtful; but if we accept his list as accurate, and add to it the three species here recorded for the first time we reach a total of 31 species, an altogether exceptional number for so small an area as New Caledonia.

Another remarkable feature of the Coniferous flora is that apparently the whole of it is endemic*. The degree of endemism in the whole Phanerogamic flora is exceedingly high, but the Conifers show it to the utmost, owing, apparently, to the imperfection of their means of seed-distribution. The isolation of the island from continental land-masses is very great, and has apparently existed since a remote epoch; so that the Conifer population has undergone prolonged independent evolution. The impression that one derives from a consideration of the flora is that New Caledonia is the remains of an area on which, prior to its isolation by subsidence, the Podocarpeæ and Araucarieæ attained a great development, and which, in fact, became an important centre for the evolution and distribution of Conifers on their migration northwards from the Antarctic Continent. The relationships of the Podocarpeæ and *Agathis*, on the one hand, are with New Zealand; and this line of migration is carried on into the New Hebrides, New Guinea, Fiji, Malaya, and India. In *Araucaria* and *Callitris*, on the other hand, we have links with Eastern Australia and Norfolk Island. *Austrotaxus* is the most southerly representative of the Taxeæ, whose centre of distribution is further north, and which were probably evolved subsequently to the northward migration of the Podocarpeæ. New Caledonia is the station of one species of *Libocedrus* in its distribution around the shores of the Pacific Ocean.

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* The flora of the New Hebrides is very imperfectly known, or exceptions might be found to this statement. *Araucaria Cookii*, which occurs in the New Hebrides, is not certainly native there. The non-endemic species in Guillaumin's (1911) list are open to suspicion of error; and my own collection includes none but endemic species (save the planted *Araucaria Bidwillii*).

The New Caledonian Conifers belong to a number of different ecological types, and are found growing in a great variety of situations. They are, however, developed in the greatest abundance in the montane forest on serpentine rocks above 3000 feet altitude, where they are present to such a degree that one may speak of Conifer forest, though Angiospermic trees and shrubs are also present. To this formation belong four Conifers of superficially similar appearance, all being trees with irregular crowns and Taxus-like leaves—viz., *Dacrydium taxoides*, *Acmopyle Pancheri*, *Podocarpus minor*, and *P. ferruginoides*. Here also are found *Callitris sulcata* var. *alpina*, *Libocedrus austro-caledonica*, *Podocarpus usta*, *P. gnidioides* var. *cæspitosa*, *P. longefoliolata*, and *Dacrydium lycopodioides*, while *Araucaria Balansæ* forms a conspicuous feature of many mountain summits by projecting high above the general level of the forest. Generally speaking, none of these Conifers can be called well-grown trees; their trunks are dwarfed, stunted, twisted, and gnarled, and their branches show signs of struggle with the severe climatic conditions and the competition of epiphytic mosses and lichens. The impression given is that they have survived on the mountain summits, owing to their qualities of stubborn resistance to unfavourable conditions rather than to any special suitability to those conditions.

This montane Conifer forest is evidently of the same type as that found on the summits in New Guinea, Fiji, Borneo *, etc., though made up of different floristic elements. It is impossible to resist the impression that these Conifer-capped mountain-tops are islands in an Angiospermic sea, originally continuous but now isolated by subsidence and by the deep dissection of exposed land-surfaces through weathering. In New Caledonia, for one reason and another, erosion has had the result of cutting up the island into a number of more or less isolated massifs, separated by deep valleys—there being no mountain chain of any great extent with a continuous surface above 3000 feet. The montane Conifer islets therefore form a kind of archipelago, of which none can be fairly called the mainland. There even appears to be a certain amount of endemism within this archipelago. For instance, *Libocedrus austrocaledonica* has hitherto been collected only on the Mont Humboldt-Nekando massif, though it seems probable that further exploration will disclose new situations for this and for other species of apparently restricted areas.

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* The lower limit of the Conifer forest in New Guinea and Borneo is at a considerably higher altitude than in New Caledonia—this being clearly related to climatic conditions due to latitude.

While this Conifer forest is best developed on the serpentine, other hard rocks also carry a similar, though less striking, association. On the gneiss of the Panié-Ignambi range in the north of the island the dominant trees above 3000 ft. are Angiosperms, and Conifers are for the most part thinly developed, though local societies (*e. g.*, of *Dacrydium taxoides*) may be found.

The lowland Conifers also furnish examples of restricted distribution, though for less obvious geographical reasons than in the case of the montane species. For instance, *Callitris sulcata* is copiously present in the valley of the River Comboui, and practically absent elsewhere; and the new genus *Callitropsis* was only met with in one restricted locality on the banks of the R. du Carénage.

For the most part, however, the more lowland forms have a wide distribution in the island, explicable by the present or recent continuity of suitable habitats. Thus *Araucaria Cookii* is found all round the coasts, though most abundant in the south; *Agathis lanceolata* occurs in all the lowland serpentine forests in the south; *Agathis Moorei* and *Austrotaxus spicata* occur throughout the forests of moderate altitude in the north; *Podocarpus novæ-caledoniæ* is a constant element of the salicifoliate riverside association in the serpentine districts; *Dacrydium Balansæ* and *Podocarpus Vieillardii* occur, though sparsely, in widely separated lowland localities; *Agathis ovata* and *Dacrydium araucarioides* are frequent in the serpentine scrub wherever this is developed at moderate heights.

With two exceptions the New Caledonian Conifers do not form forests in which a single species is dominant over wide areas. The exceptions are the "Comboui Pine" (*Callitris sulcata*), which forms pure light forest in the Comboui Valley, and the "Columnar Pine" (*Araucaria Cookii*), which grows in dense forests on the Isle of Pines and the neighbouring coral and shingle islets. A remarkable landscape feature is produced by the presence on the most exposed and arid serpentine crests of a thin sprinkling of Araucarias, which are the only trees present, the rest of the vegetation being low xerophilous scrub. In this way we find *Araucaria Muelleri* on the summit of Mont Koghi and on the mountains bordering the Plaine des Lacs, *A. Rulei* on the bare crests of the Presqu'île Bogota and other serpentine hills near Canala and Nakety, and *A. montana* on the summit of Taom and elsewhere.

CYCADALES.

CYCADACEÆ.

Cycas sp. Bay of Prony; littoral zone; serpentine. Estuary of River Néra, near Bourail; littoral zone. Île Mouac; littoral zone. 868, 2284. I am unable to determine to which species, *C. circinalis* L. or *C. Rumphii* Miq., these gatherings belong, though I incline towards the latter. The two species are undoubtedly very closely allied, and the confusion existing between them is largely due to the imperfection of herbarium material and the considerable variation of essential parts on one and the same plant.

CONIFERALES.

TAXACEÆ.

Podocarpus.—All five of Pilger's sections of this genus are represented. The species belong to a variety of ecological types and occur in widely distinct habitats. The total number of species occurring in New Caledonia may be taken as not less than eight or nine.

P. (§ Stachycarpus) ferruginoides R. H. Compton, sp. nov. *Arbor* 10–15 m. alta irregulariter ramosa; *truncus* erectus validus cortici rugosa indutus; *ramuli* subdorsiventrales; *folia* in sicco ferruginea spiraliter inserta plus minusve uno planitie expansa non petiolata e basi angusto decurrente erecto-patentia coriacea glabra oblonga 10–15 mm. long. 3 mm. lat. obtusa sed minute apiculata, costa media haud conspicua; *flores masculi* mihi ignoti; *flores feminei* omnes cœtanei; *ramulus ovuliferus* axillaris brevis tenuis 5–8 mm. long. basin versus squamis minutis triangularibus dense tectus; in parte distale ramuli squamulæ sensim majores lineares 3–5 mm. long. haud 1 mm. lat. obtusæ plus minusve recurvatæ glaucæ foliis parvis similes; folium lineare supremum unicum carpidium formans; *ovulum* ovoideum glaucum obtuse apiculatum; *semen* rotundato-ovoideum non apiculatum 12–14 mm. longum glaucum, testa duplici exteriore carnosa interiore lignosa.

Nekando; coniferous forest; above 3000 ft.; serpentine. 1073, 2029. Differs from the New Zealand *P. ferruginea* in the shorter and relatively broader oblong leaves whose mid-ribs are scarcely evident, in the elongated linear bracts on the distal part of the seed-pedicel, and in the more nearly spherical seed without apiculus when mature. Pilger (in Engler's 'Pflanzenreich,' iv. 5, p. 67) refers to a specimen collected by Lecard, in the Paris Herbarium, as being *P. ferruginea* D. Don, a species otherwise known only from New Zealand. I have not seen this specimen, and cannot therefore say whether it is rightly so-called or whether it should not rather belong to *P. ferruginoides*. Guillaumin does not mention *P. ferruginea* in his catalogue.

PODOCARPUS (§ Dacrycarpus) VIEILLARDII Parl. River Comboui; streamside; serpentine alluvium; 50 ft. 2227. I saw this tree in one locality only, on the banks of a small tributary of the river, near its mouth, where it was sparingly present. Here it was a tree of 40 ft. of a narrow asymmetrical habit of growth. The leaves are remarkably dimorphic; "juvenile" forms with dorsiventrally flattened branchlets suggestive of *Sequoia sempervirens* being borne on mature trees along with "mature" foliage which recalled *Sequoia gigantea*; reproductive organs are borne on the branches of the latter type alone. This dimorphism upsets Pilger's clavis to the species of his § Dacrycarpus (*l. c.*, p. 56): it is at least as marked a feature in *P. Vieillardii* as in *P. imbricata*.

P. (§ Microcarpus) USTA Brongn. & Gris. Ignambi; high forest; gneiss; 3500 ft. 1545. This curious plant was seen on one occasion only, and then in very small quantity.

P. (§ Nageia) MINOR Parl. Mt. Mou; coniferous forest; serpentine; 3500 ft. Ignambi; coniferous forest; gneiss; 3500 ft. 607, 1524, 1587. Balansa's notes, as quoted by Brongniart and Gris and copied by Pilger, refer to *P. minor* as a shrub of about 1 m. in height. My specimens, however, which match the type (Vieillard 1275) perfectly, were collected from trees of 40–50 ft. in height. The name *P. minor* is therefore something of a misnomer. The tree is a frequent constituent of the conifer forest above 3000 ft. all over New Caledonia. The wood has a sweet resinous scent, and the ripe seeds are bright red.

P. (§ Eupodocarpus) NOVÆ-CALEDONIÆ Vieill. ex Brongn. & Gris. Rivers Dumbéa, Comboui, Carénage, etc.; abundant along river-banks in serpentine districts at low altitudes. 402, 419, 2017, 2169. This shrub is characteristic of serpentine riversides, where it is associated with other narrow-leaved shrubs. It never exceeds a few feet in height, a rare habit in Eupodocarpus. The young leaves are glaucous, becoming dark green when older. The ripe seed-receptacle is bright scarlet or purple, soft, translucent, and sweet to the taste.

PODOCARPUS LONGEFOLIOLATA Pilger. Mt. Mou; summit forest; serpentine; 3500 ft. 501.

P. GNIDIOIDES Carr. var. CÆSPITOSA Carr. Mt. Dore; among rocks in serpentine scrub; 1200 ft. Comboui mountains; in scrubby coniferous forest; serpentine; 3500 ft. 678, 2189.

Carrière's original description refers to *P. gnidioides* as a tree of 12–15 m. in height: he separates the var. *cæspitosa* on the ground of its small shrubby stature, remarking that he would not be surprised if this were merely a habitat form. My notes refer entirely to a shrub of 3–5 ft., and Schlechter also describes his specimens as coming from small shrubs. The typical *P. gnidioides* was described in the absence of reproductive organs, though those of var. *cæspitosa* are well known. Until the strobili of the arboreal plant have been collected, it will be impossible to decide as to its relationship with the var. *cæspitosa*.

PODOCARPUS sp. indet. Mt. Canala; transitional forest on schists; 1500 ft. 1273. A narrow tree of about 25 ft., with oblong-lanceolate dark green shining leaves, 8–9 cm. long by 1·5 cm. broad; the midrib conspicuous. Sterile branches alone were collected, which I have been unable to match.

PODOCARPUS sp. indet. Plaine des Lacs; serpentine hillsides; 1000 ft.; rare. 271. A small tree of the § Eupodocarpus: unfortunately only ovules were collected.

ACMOPYLE PANCHERI Pilger. Mt. Mou; abundant in coniferous forest near summit; serpentine; 3500 ft. 485. A tree of 30–40 ft. occurring in the mixed coniferous forest of certain serpentine mountains above 3000 ft., along with *Podocarpus minor*, *P. ferruginoides*, *Dacrydium lycopodioides*, *D. taxoides*, and *Libocedrus austrocaledonica*. From the *Podocarpus* spp. and *Dacrydium taxoides* it is difficult to distinguish in the field without some experience, in the absence of female reproductive shoots. Nearly ripe seeds were found in March. The genus is monotypic and confined to New Caledonia.

DACRYDIUM.—Four species occur in New Caledonia, all being of widely distinct type and occurring in a variety of situations.

DACRYDIUM ARAUCARIOIDES Brongn. & Gris. Plaine des Lacs; abundant on moderate slopes 800–1500 ft.; serpentine; Presqu'île Bogota; Comboui mountains, etc. 320. This remarkable endemic *Dacrydium* is characteristic of serpentine rocks all over the island, occurring in dry arid localities and not entering the forests. A singular feature, apparently not previously recorded, is the fact that the whole apex of the female shoot becomes purple and fleshy on maturity, as in *Podocarpus* spp. and *Microcachrys*: this does not occur, as far as is known, in any other *Dacrydium*, though in *D. cupressinum* the epimatium becomes somewhat fleshy. *D. araucarioides* comes up fairly readily from seed in its native localities, where there is always a fair amount of bare soil. The young plants have a distinct juvenile form, with linear pinoid erecto-patent leaves reaching 1 cm. in length. Growth is slow in the arid conditions, and the mature tree rarely exceeds 20 ft. in height, having a sparse candelabrum form.

D. LYCOPODIOIDES Brongn. & Gris. Mt. Mou; coniferous forest; serpentine; 3500 ft. 622. A tree of 30–40 ft., with a slender and graceful habit. The juvenile form (No. 622 *a*) is very distinct, having filiform erecto-patent leaves about 1 cm. long.

D. TAXOIDES Brongn. & Gris. Ignambi; high forest; gneiss; 3000 ft. 1571. My gatherings were from trees of 50 ft. Brongniart and Gris quote Pancher to the effect that *D. taxoides* is a shrub of about 3 m. in height. I do not doubt, however, that my specimens belong to this species, whose mature stature is thus seen to vary widely.

D. BALANSÆ Brongn. & Gris. River Comboui; lowland forest of riverside; serpentine; 50 ft. 2015. I saw this tree on one occasion only, and was then unable to find reproductive branches.

AUSTROTAXUS Compton, gen. nov. (Pl. **26**.)

Arbor foliosa non resinosa. Tracheides marginato-punctati non spiraliter crassati. *Ramuli fertiles* axillares. *Ovulum* singulare terminale orthotropum integumento unico. *Semen* in arillo carnoso undique inclusum. *Strobilus masculus* spicatus bracteatus: stamina peltata in bractearum axillis: microspora haud alata. Genus adhuc monotypicum.

A. SPICATA Compton, sp. nov. *Arbor* dense foliosa 15–25 m. alta. *Truncus* cortice griseo rugoso tectus copiose ramosus. *Folia* in ramulis spiraliter sessilia anguste lineari-lanceolata circa 10–15 cm. long. 6–8 mm. lat. saturate viridia glabra integra acuta marginibus leviter revolutis; costa media inferne prominens superne sulculo notata. *Ramuli ovuliferi* in foliorum vel bractearum axillis, basin versus ramorum juvenilium orti, basi diametro circa 2 mm., bracteis multis minutis imbricatis appressis late orbicularibus concavis auriculatis crassis, basalibus minoribus, dense spiraliter tecti. *Ovulum* terminale rectum 2- raro 3-carinatum, hora fecunditatis circa 12–16 mm. long. 7–9 mm. lat. ovoideum vel ellipsoideum; *integumento* unico externe lignoso interne carnoso micropylo bilabiato apiculato; *arillo* semen fere includente carnoso, ore stricto ovale vel rotundo micropylum circumdato. [Semen maturum non visum.] *Ramuli masculi* in eodem situ ac femini orti singuli spicati circa 15 mm. long., bracteis 12–15, 4 vel 5 basalibus minoribus appressis, superioribus late deltoideis acutis erecto-patentibus 2 mm. long. basi subcrassis. *Stamina* peltata, 1–5 in bracteæ cujusque axillo, microsporangiis 2–4 intus inspicientibus, microsporis haud alatis.

Mt. Canala; moist forest on steep slopes; schists; 2000 ft. Ignambi; high forest; gneiss; 2500 ft., etc. 1155.

A large tree with a dense bushy crown of dark green foliage, when well grown; somewhat frequent on the schist and gneiss rocks of the northern half of the island, where it enters into the composition of intermediate and high forest between about 1000 and 3000 ft. In its general habit of growth and in its leaves it closely resembles a *Podocarpus*. The female shoot shows marked affinities with *Taxus* in the orthotropous ovule enclosed in a fleshy aril and borne singly at the apex of a short bracteate axillary peduncle: to this genus it also approximates in many structural details. The male strobilus, however, while clearly Taxoidean, differs sharply from that of other known genera in its spicate form (to which I have called attention in the specific name). The peltate stamens are similar to those of *Taxus*, but are borne in the axils of the bracts of an extended spicate strobilus. The pitted tracheids of the wood are devoid of spiral thickenings (characteristic of *Taxus*).

With the exception of *Taxus baccata* var. *Wallichiana*, which crosses the equator in the East Indies, this is the only known Taxoidean native in the southern hemisphere.

It is remarkable that *Austrotaxus* should have hitherto been overlooked by collectors, as it is by no means infrequent nor inconspicuous.

PINACEÆ.

Araucaria.—Guillaumin catalogues eight species, some of doubtful validity, in New Caledonia. My collection includes five, viz., *A. Balansæ*, *A. Cookii*, *A. Rulei*, *A. montana*, and *A. Muelleri*; of these Brongniart and Gris have given an excellent comparative account (Bull. Soc. Bot. France, xviii. p. 130, 1871). The other species recorded, viz., *A. excelsa* (a doubtful record by Forster), *A. intermedia*, and *A. Raouli*, I am not acquainted with, neither in the field nor in herbaria. *A. Goldieana*, mentioned in the Index Kewensis as New Caledonian, is of doubtful horticultural origin (see T. Moore, in Flora & Pom. 1877, p. 39). *A. Bidwillii* has been successfully planted in the Isle of Pines.

ARAUCARIA BALANSÆ Brongn. & Gris. Mt. Mou; summit; 3500 ft.; serpentine. Plaine des Lacs; forest in gully; serpentine; 1000 ft. Nekando; forest in gully; serpentine; 2000 ft., etc. 286. The smallest-leaved of any of the New Caledonian Araucarias; in general aspect much like *A. Cookii*, but has a different habitat, being found on the summits of lofty serpentine mountains and in elevated forests in their gullies, where it protrudes conspicuously above the general level of the canopy. As in other *Araucaria* spp. several juvenile forms exist, with leaves longer and narrower than those of the mature shoots.

A. COOKII R. Brown. Île Porc-Épic; littoral zone and sub-littoral; serpentine; etc., etc. 923. This celebrated tree attains its greatest abundance in the south of the island and on the Isle of Pines and adjoining islets. It is typically a tree of the sub-littoral zone, but grows also on the seaward slopes of serpentine hills up to an altitude of a few hundred feet, as in the Port Boisé District, on Cap Bocage, and elsewhere: it is planted inland by the natives as an ornament to their villages. The remarkable aspect of the rocky islets sparsely clothed with this slender "pin colonnaire" is expressed in the name, twice used, of the Île Porc-Épic. Even more singular are the tiny coral and sand islets around the Isle of Pines, which, though only a few feet above high-tide mark, are densely covered with forests of this tree—the result being almost to justify the Forsters' suggestion that the islets were composed of basaltic columns. The timber is being ruthlessly exploited, and this unique tree is going the way of other natural beauties under the touch of civilization.

A. MONTANA Brongn. & Gris (ex descr.). Taom; serpentine; mountain summit, 3590 ft. 2345. Closely resembles *A. Rulei* in general appearance and in the situations in which it grows, but differs from that species in the size and shape of its leaves and in various other points.

A. RULEI F. Muell. Presqu'île Bogota; abundant on arid serpentine plateau; 2000 ft. 1314. A conspicuous object on the serpentine hills in the neighbourhood of Canala. It inhabits the most arid situations, where it is exposed to the full force of every wind and to the periodical cyclones. It gives a remarkable *cachet* to the landscape, whose bright red soil is otherwise scantily covered with low scrub and occasional small trees of *Dacrydium* *araucarioides*. In the size and shape of its foliage it is intermediate between its close relatives, *A. montana* and *A. Muelleri*.

ARAUCARIA MUELLERI Brongn. & Gris. Plaine des Lacs; summit of bare serpentine hills; 1500 ft. Mt. Koghi; summit; 3540 ft.; serpentine. 289, 748. This species, distinguished from *A. Rulei* by the larger size of its leaves, was met with in two localities only, both in the southern serpentine district, where, like *A. Rulei* and *A. montana* further north, it occupies the crests of serpentine mountains, otherwise covered only with scrub. No cones were found.

A. BIDWILLII Hook. Vao, Isle of Pines; planted. 2274. The bunya-bunya, native of Australia.

AGATHIS.—The nomenclature of the New Caledonian species is inextricably confused. There appear to be three species, for which I adopt the nomenclature of Pancher (in Sebert, Not. Bois. Nouv. Caléd. p. 169, 1874) as being less involved in ambiguities and inconsistencies than any other method of treatment.

Two species, *A. lanceolata* and *A. Moorei*, are typically forest trees. *A. lanceolata* is a magnificent species with a massive trunk often rising to a height of 50 ft. before branching; its bark is reddish brown, smooth, and scales off in thin flakes; its leaves are large, ovate-lanceolate with an acute apex, and not glaucous; its mature female cone is broadly elliptical. This is the tree characteristic of high forest on serpentine, below 1000 ft. altitude, throughout the southern half of New Caledonia. Its wood is valuable, and is being exploited in various places, notably at the Baie des Pirogues; it also produces immense quantities of resin. *A. Moorei* is a markedly smaller tree, whose trunk never attains the height or diameter of *A. lanceolata*; its leaves are much smaller and are narrowly elliptical; its mature female cone is globose or obovate, often almost pear-shaped, and is distinctly smaller than that of *A. lanceolata*. It is also a forest-tree, but has a different habitat, occurring on the schistose and gneiss rocks of the northern half of the country, typically at 1000–2000 ft. altitude.

The third species, *A. ovata*, never enters into the composition of forests. It is an inhabitant of the arid exposed serpentine ridges and slopes in the south of the island, usually in solitude, rarely forming a small local society, from sea-level to about 1500 ft. altitude. It seldom exceeds 30 ft. in height; its trunk is covered by a rough greyish bark, which is deeply creviced—quite unlike that of *A. lanceolata*. The leaves are variable, much more coriaceous than in the two woodland species, glaucous below, especially when young, oblong-elliptical, not acute. The female cones are elliptical and smaller than those of *A. lanceolata*.

AGATHIS OVATA Warburg. Hills by Riv. Ngoye; serpentine; 500 ft. Slopes bordering Plaine des Lacs; serpentine; 1000 ft. Hills near Kuakué; serpentine; 1000 ft., etc. 968.

The origin of the specific name is in Gordon's 'Pinetum,' Supplement, p. 28, 1862, where *Dammara ovata* C. Moore is described simply as "a kind with small roundish leaves, found in New Caledonia."

The so-called type-specimen in the Lindley Herbarium at Cambridge is certainly not the one referred to by Moore, but is *A. lanceolata* Pancher.

Pancher takes up the name *ovata* for a tree which is identical with my 968; this is clear from his description, and from a specimen in Herb. Mus. Brit. labelled *Dammara ovata* Lindl., apparently in Pancher's handwriting. I agree with Pancher in thinking that this must have been the species on which Moore founded the specific name *ovata*, despite the Lindley specimen. This name has also been adopted by Schlechter for his Nos. 15130 and 15131 from the Ngoye hills, 150 m. alt.

A. LANCEOLATA Pancher. Plaine des Lacs; forest in gullies; serpentine; 800 ft. Mt. Koghi; valley forest; serpentine; 1000 ft. R. Ngoye; forest by riverside; serpentine; 300 ft., etc. 335. This species is represented in English herbaria by a considerable number of specimens under a variety of names. It appears to be the *Dammara ovata* C. Moore of Gordon's 'Pinetum,' ed. III. p. 112, 1880, and the specimen in the Herb. Lindley at Cambridge, sub nom. *D. ovata*, according to my view, is this species.

A. MOOREI Warburg. Mt. Panié; forest; gneiss; 1500 ft. Mont Canala; forest; schists; 1500 ft. There is apparently no confusion in the nomenclature of this species, whose narrow lanceolate leaves sufficiently distinguish it from other species. I saw isolated trees on Mont Canala, but it was more plentifully developed on Mont Panié forming small groves in the forest. It is apparently absent from serpentine soils and is confined to the northern half of New Caledonia.

CALLITRIS SULCATA Schlechter [=*Frenela sulcata* Parl.; *Frenela Balansæ* Brongn. & Gris]. Valley of R. Comboui; locally dominant, forming extensive light woods; serpentine; 50–1000 ft. 2013. A fine symmetrical tree of about 40 ft., usually with an erect smooth trunk and a conical form. The wood is camphor-scented, and is very hard and durable. The great abundance of this tree in the Comboui Valley (it is locally known as the "sapin de Comboui") is most striking, as it appears to be completely absent from the next river-valley, that of the R. Ngoye, with which it is contiguous near the mouth. It has, however, been recorded from the banks of the R. Dumbéa, near Koé, by Balansa.

The juvenile state is remarkably distinct. Instead of the casuarinoid trimerous ultimate branchlets, the young shoots bear free leaves in whorls of 3–4, the leaves being linear, decurrent, dorsally carinate, apiculate, 2 cm. long, 1 mm. broad: they gradually diminish in length on later-produced branches and so pass into the mature, almost completely adnate, cupressoid type of leaf.

This species was described first by Parlatore, as *Frenela sulcata*, from material in the Hooker Herbarium (now in Herb. Kew.); Brongniart and Gris, who apparently did not see Parlatore's specimen, described as *Frenela Balansæ* a plant distributed as Balansa 182, an example of which is also in the Kew Herbarium. This plant is also distributed as Balansa 2506.

The other *Frenela* imperfectly described by Parlatore (DC. Prodr. xvi. 2, p. 447) as *F. subumbellata* from a plant in the Hooker collection, is the juvenile form of *Callitris sulcata*. Parlatore's two types are mounted on the same sheet in the Kew Herbarium, labelled "Moore 5," and there is no doubt that they are identical.

CALLITRIS SULCATA var. ALPINA, R. H. Compton, var. nov. Varietas a typo differt statura minore, habitu candelabriforme, ramulis confertis, et internodiis brevioribus 2–3 mm. longis.

Nekando; abundant in Conifer forest, locally dominant on rocky places; serpentine; 3500 ft. 2026. This may be merely a habitat form, as it differs from typical *C. sulcata* in points of degree only, such as might be produced by the greater exposure in which it grows. I think, however, that it should probably be regarded as distinct, on account of the discrete areas which the two plants inhabit: *C. sulcata* being a lowland valley-dweller, not found, in my experience, above 1000 ft.: while the var. *alpina* is found on the same soil only at altitudes above 3000 ft.,—the intervening two thousand feet being apparently unsuited either to the type or the variety. My plant matches Schlechter's 15179 (sub nom. *C. Balansæ*), which also comes from the Ngoye Mountains at 1000 m. altitude.

CALLITROPSIS, R. H. Compton, gen. nov. (Pl. **27**.)

Arbor monœcia. *Folia* verticillis tetrameris libra non adnata. *Flores feminei* ex squamis 8 duobus verticillis similibus constructi; squamæ angustæ, appendiculum dorsalem conspicuam ferentes, haud lignosæ; columella centralis adest; *ovula* orthotropa circa 8. *Semina* 1–4 vix alata; embryo 2 cotyledonibus. *Flores masculi* strobiliformes, ex pluribus verticillis tetrameris constructi. Genus adhuc monotypicum.

C. ARAUCARIOIDES R. H. Compton, sp. nov. *Arbor* usque 10 m. alta, forma conica, trunco erecto, cortice griseo, omnibus partibus resinosa.

Rami horizontales. *Ramuli* cylindracei fastigiati irregulariter furcati cum foliis 6–8 mm. lati. *Folia* verticillata tetramera ordinibus 8 erecto-patentia imbricata rigida incurvata basi lata sessilia non decurrentia externe carinata, interne plana, 5–7 mm. long. 2–2·5 mm. lat. acuta margine minute ciliato. *Strobili masculi* in ramulis longis terminales ovoidei 10–12 mm. long. 5–6 mm. lat., verticillis sporophyllium tetrameris circa 8; sporophyllia foliis similia, sed basi latiora, maxima 5 mm. long. 3 mm. lat., dense imbricati, basi sporangia sessilia ferentes. *Flores feminei* in ramulis brevibus lateralibus terminales late ovoidei, verticillis tetrameris 2; squamæ exteriores non concurrentes, interiores confertæ angustæ crassæ interne carinatæ 1 cm. long. prope apicem appendiculam conspicuam patentem 5 mm. long. ferentes. *Columella* parva centralis conica adest. *Ovula* squamis cincta circa 8, quorum 1–4 semina fiunt, altera inchoata manentia. *Semina* 2–3-angulata, pæne alata. *Embryo* duobus cotyledonibus. In maturitatem squamæ feminæ inter se separant, speciem involucris formantes, ex qua semina effugiunt. *Ramuli juveniles* foliis longioribus patentioribusque.

R. du Carénage; riverside on serpentine rocks; 800 ft. 379. This new species should undoubtedly be placed in the Actinostrobinæ, in near relationship with *Callitris*. Within that genus its affinity is closest with *C. Macleayana* from East Australia, the sole member of the section Octoclinis, which also shows prevailing tetramery. There can be little doubt (at least to those who agree with the disintegration of the genus *Callitris* in the wider sense into the genera *Tetraclinis*, *Widdringtonia*, and *Callitris* sensu strictiore) that this new plant differs sufficiently from the rather homogeneous species of *Callitris* (sens. strict.) to deserve separate generic rank. The habit of growth of the tree is strikingly araucarioid, and so are the small, stiff, free, imbricate leaves. The arrangement of the leaves in very regular alternating whorls of four, thus producing eight conspicuous vertical rows of leaves on the twig, is a striking and unique feature. The tetramerous arrangement of the leaves is prolonged without break into the terminal male and female cones. The female strobili are very distinct from those of *Callitris* spp. The eight scales are arranged in two whorls, the members of the inner whorl meeting in the centre, and those of the outer whorl covering the external gaps; the scales themselves are erect and slender, the inner ones being thickened at the apex where they come into contact among themselves. Subapically each scale bears a leaf-like spreading appendage. When the cone is mature the eight scales separate from one another, forming a kind of cup-like involucre from which the ripe seeds are scattered. The ovules are about eight in number, arranged around a small central columella; the ripe seed is scarcely winged and contains a dicotyledonous embryo.

Callitropsis araucarioides was met with in a single limited locality, where it was first noticed by my companion, the late Paul Denys Montague. It was growing freely on the serpentine rocks by the side of the R. du Carénage, bordering on the Plaine des Lacs, at an altitude of about 800 ft. It apparently belongs to the serpentine scrub formation, in the same way as does *Dacrydium araucarioides*, to which it bears some resemblance.

LIBOCEDRUS AUSTROCALEDONICA Brongn. & Gris. Nekando; in coniferous forest above 3500 ft.; serpentine. 1072, 2020. This is the only species of *Libocedrus* recorded for New Caledonia, and has only been collected so far from the Nekando–Mont Humboldt massif, where it grows in mixed coniferous forest at altitudes above 3500 ft., though never in luxuriance. It is a small symmetrical tree, never growing to more than 20 ft. in height, and of a spare habit. The male cones are now described for the first time:—

Strobili masculi singulariter ramulos ultimos terminantes, breve ovato-oblongi, in sectione transverso quadranguli, 5–6 mm. long. 2 mm. lat. *Squamæ* decussatæ 16–24, quisque basi rotundato, limbo late triangulare pauce carinato, margine stricte membranoso integro, apice acuta, superne basin versus sporangia gerentes.

EXPLANATION OF PLATES 26, 27.

PLATE 26. *Austrotaxus spicata* Compton. 1. Branch bearing male cones, nat. size. 2. Microstrobilus before dehiscence of anthers, × 2. 3. Bract bearing two stamens seen from above, × 10. 4. Stamen after dehiscence, × 10. 5. Portion of twig bearing ovuliferous shoots, × 2. 6. Longitudinal section of an older ovuliferous shoot, showing protruding micropyle at apex, × 2. 7. Full-grown seed, side view, × 2. 8. Seed in apical view, × 2. 9. Seed in longitudinal section, × 2.

PLATE 27. *Callitropsis araucarioides* Compton. 1, 2. Branches showing juvenile and mature foliage respectively, nat. size. 3. Microstrobilus, × 2. 4, 5. Bract bearing pollen-sacs, seen from below and from the side respectively, × 4. 6. Tip of leafy shoot bearing a full-grown megastrobilus, × 2. 7. The same seen from above, × 2. 8. Megastrobilus in median longitudinal section, showing seeds and columella, × 2. 9. Seeds, × 2. 10. Megastrobilus after opening and scattering seeds, × 2. 11. The same in median longitudinal section, × 2.

R.H.Compton.

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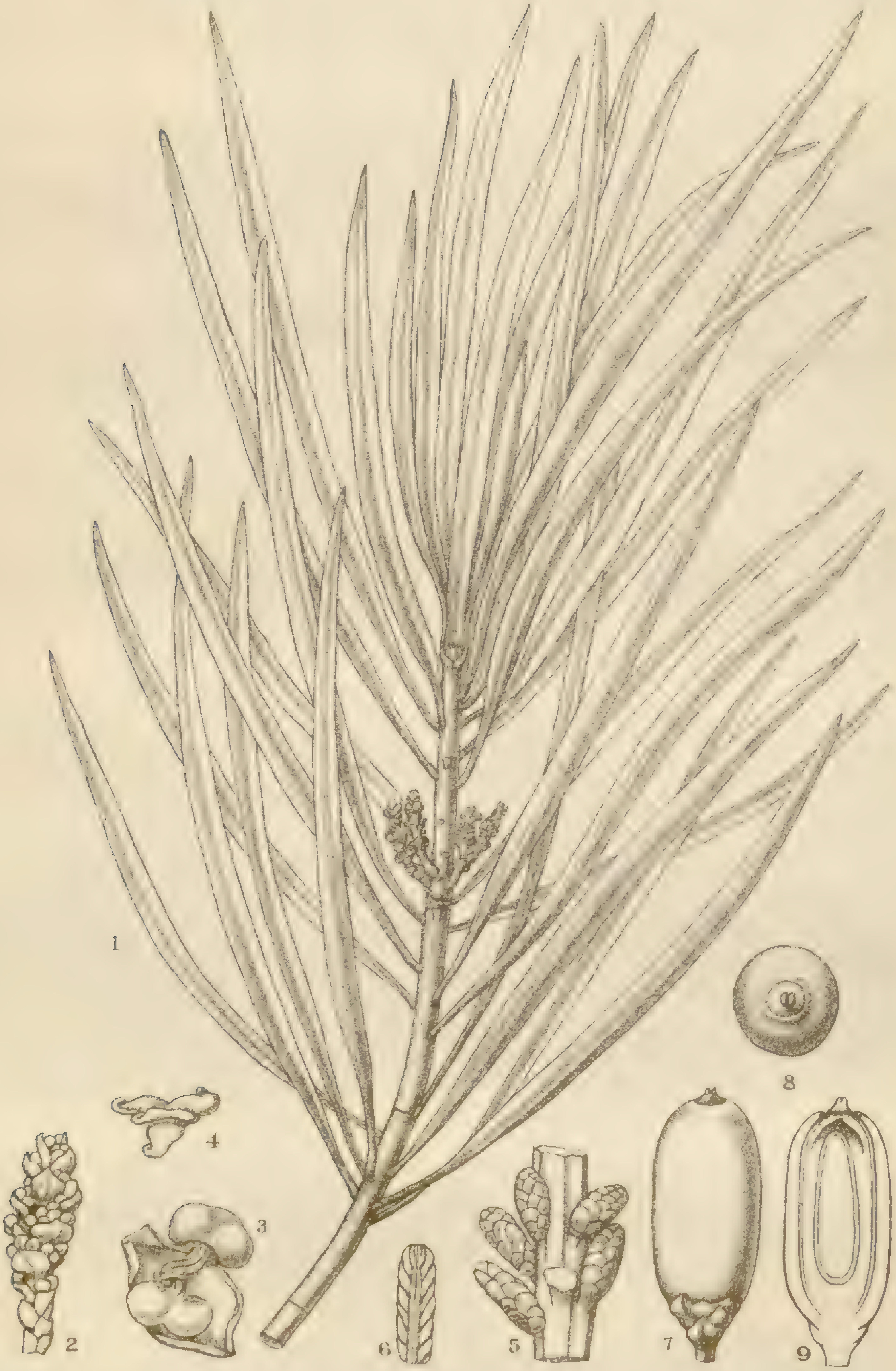
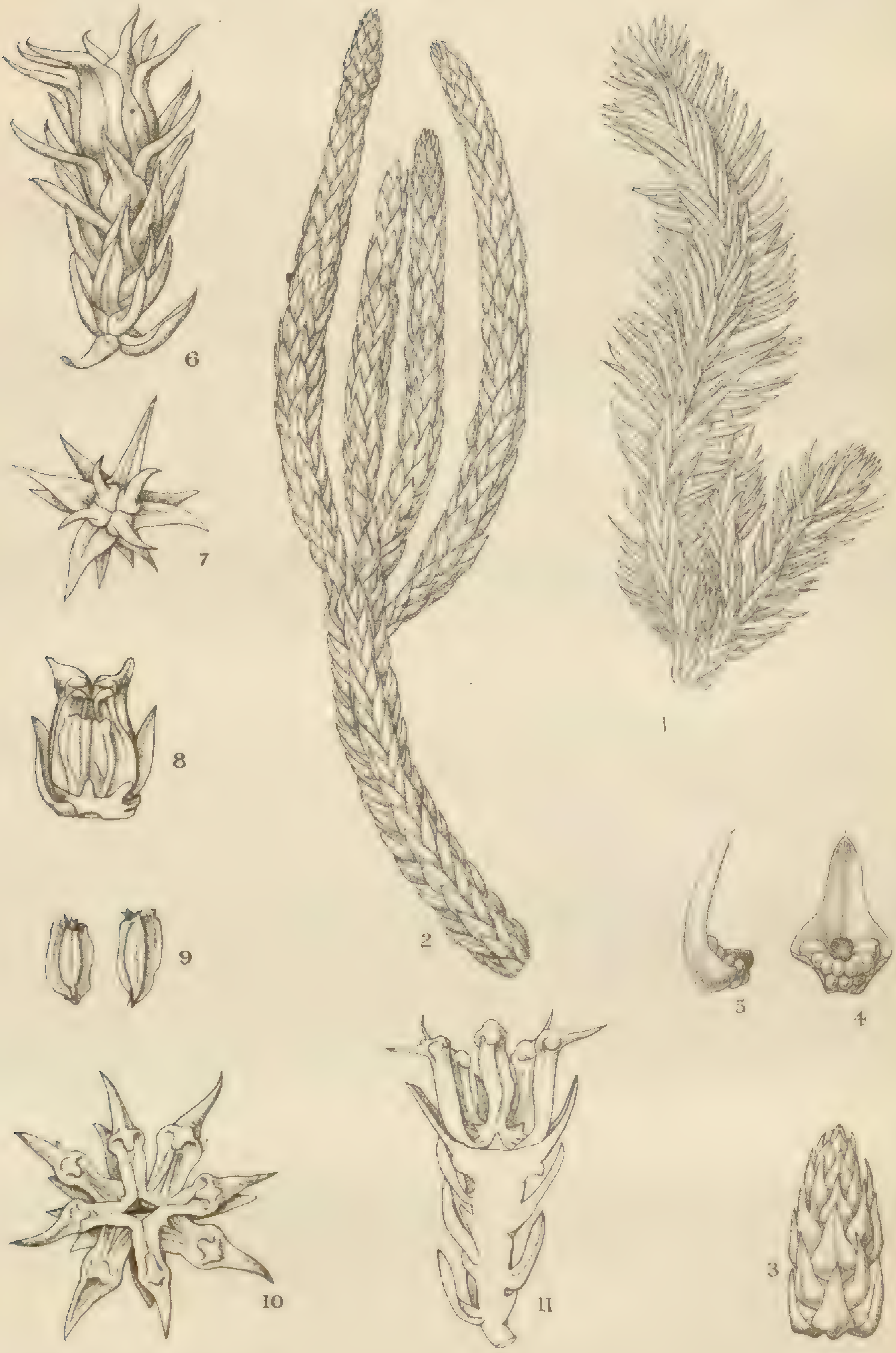


M.McPage & P.Highley del.
P.Highley Lith.

C.Hodges & Son, imp.

AUSTROTAXUS SPICATA.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M.M.Page & P.Highley del.
P.Highley lith.
C.Hodges & Son, imp

CALLITROPSIS ARAUCARIOIDES.

PTERIDOPHYTA.

By R. H. Compton.

All the main groups of Vascular Cryptogams are represented in New Caledonia, except the Isoetales,—Ferns and Lycopods being present in a remarkable degree. Fournier ("Filices Novæ-Caledoniæ: Enumeratio Monographica" in Ann. Sci. Nat. Bot. 5^e ser. xviii. 253, 1873) recorded no fewer than 259 species of Ferns from the Archipelago. Some of these records are doubtful; but, on the other hand, a number of new species has been added since 1873, through the collections of Le Rat, Fournier, and others. An estimate of about 250 species of Ferns would, I think, approximate to the truth. It appears probable that further collections will not add largely to this total; though it must be remembered that a large part of the country, and that apparently of the most interesting character, is so far botanically unexplored. My own collections, which include 149 Ferns and 26 other Vascular Cryptogams, contain few novelties in comparison with the wealth of new material obtained among the Phanerogams: 7 new species, 8 new varieties, and 7 new forms being all that have resulted. The fact that the New Caledonian Pteridophyta are so much better known than the Flowering Plants is largely due to the greater ease with which they can be collected in good condition for preservation and study.

The degree of endemism which obtains among the New Caledonian Pteridophyta is noteworthy, but is small in comparison with that of the Phanerogamic flora. Of the 44 genera of Ferns represented in my collection, only one, *Stromatopteris*, is endemic; and of the 142 species of Ferns and 25 species of Fern Allies, 56 and 9 respectively are endemic, giving a total percentage endemism of 39. Of Fournier's 259 species of Ferns 86 were endemic, this being about 33 per cent.

As Fournier and Diels have pointed out, the endemic species include both primitive types, of which *Stromatopteris* is the most remarkable, and also groups of species produced by local evolution in the isolation of insular life: of these latter the genera *Lomaria* and *Lindsaya* and the *Trichomanes* of the *T. dentatum* alliance are noteworthy examples. The Pteridophyta, just as do other groups, point clearly on the one hand to the antiquity of the New Caledonian land-surface, and on the other to its prolonged isolation from neighbouring land-masses.

The endemic species are very unequally distributed among the genera: some large genera (e.g., *Hymenophyllum*, *Lindsaya*, *Lomaria*, *Selaginella*) are almost entirely represented by endemic species, while other related genera (e.g., *Trichomanes*, *Davallia*, *Lycopodium*) show a low degree of endemism.

The general relationships of the New Caledonian Pteridophytes are with the floras of the surrounding land-masses—more especially with the East Australian and Malayan regions. The species fall into two main groups: firstly, those with geographical connections with temperate Australia, Tasmania, New Zealand, Norfolk, and Lord Howe Islands; and, secondly, those with connections with the tropical Malay, Australian, and Polynesian areas. The second group markedly preponderates*. The Pteridophyta play a very large part in the vegetation of the island. Great areas of the serpentine districts are densely covered with *Pteridium aquilinum* var. *esculentum*, *Gleichenia linearis*, or *G. circinata*. In open situations the schist rocks of the centre and north are frequently clothed with *Lycopodium cernuum*. In the forest on all soils Vascular Cryptogams are a constant and abundant feature: homogeneous associations dominated by single species are frequent, from local groups of arborescent ferns in the tree layer, and groves of Marattias, *Leptopteris Wilkesiana*, *Selaginella megastachya*, *S. hordeiformis*, etc., in the undergrowth, to the dense covering of filmy ferns, such as *Trichomanes album* and *T. saxifragoides*, on rocks and trunks. Ferns occur in greater or less abundance in every main kind of ecological position, from mangrove-swamp to rock-crevice and from the sun-scorched hillside to the constantly saturated conditions of the cloud-forest.

Little support is given by the Pteridophyta to Schlechter's view (in Engl. Bot. Jahrb. xxxvi. 8) that New Caledonia can be divided into two floristic regions, north and south—the north having relationships with the Malayan flora, and the south with the floras of E. Australia and New Zealand. The four Malayan species of Ferns, mentioned by Diels (*op. cit.* xxxix. 4) as being collected by Schlechter in the north of the island only, were all found by me in Schlechter's "Sudbezirk" also; *Nephrolepis cordifolia* on Mt. Mou, *Davallia alpina* near the Ngoye River, *Pteris incisa* by the Ermitage Stream, and *Ophioglossum pendulum* in the forests of Mt. Canala. In the genus *Lycopodium*, on the other hand, as Pritzel (*loc. cit.* 13) points out, the primitive forest epiphytes reach their southern limit in the north of New Caledonia, while the subtropical Australian element is represented in the south. My collections, on the whole, support this conclusion, though *L. squarrosum* var. *pacificum* was found in the south on Mt. Humboldt; the newly recorded *L. varium*, previously known in Australia, Tasmania, New Zealand, and the Auckland Islands, was found on Mt. Koghi in the south. On the whole, in considering the Pteridophyta as well as other groups, the impression I have derived is that the local distribution of plants on the surface of New Caledonia (an area which there is every reason to believe has remained in isolation from a remote period) is primarily a matter of edaphic and climatic conditions, and that the apparent division into a northern "Malayan" region and a southern "Australian" region is mainly a result of the fact that climate and soil favour the preponderance of tropical forest in the north and of a more subtropical scrub vegetation in the south; so that "Malayan" species, on the whole, find themselves more at home in the "Nordbezirk" and "Australian" species in the "Sudbezirk."

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* See Christ, 'Geographie der Farne,' p. 234 (Jena, 1910).

FILICALES.

HYMENOPHYLLACEÆ.

HYMENOPHYLLUM CRISPATUM Wall. var. MINUS Hook. Ignambi; creeping on rocks near stream; gneiss; 300 ft. 1597. North India, Malaya, Australia, New Zealand, Antarctic Islands.

H. DEPLANCHEI Mett. Ignambi; frequent creeping over rocks and trunks; 2500–4200 ft. 1553.

H. DIMIDIATUM Mett. Mt. Mou; on tree-trunks in cloud-forest; 3700 ft. 482.

H. LE RATII Rosenstock. Ignambi; on tree-trunks in moist forest; 3800 ft. 1651.

H. MNIOIDES Baker, forma AMPLIOR R. H. Compton, form. nov. Ignambi; on bark of forest trees; 300 ft. 1634, 1831. Deplanche 1 (summit of Mt. Mou, 1260 m., on the trees). Balansa 2702 (Mt. Mou, 1150 m.; mossy trunks).

Baker incorrectly describes Deplanche's plants as having "segments all quite simple"; some, but not all, of Deplanche's specimens in Herb. Kew. have some of the lower pinnæ forked into two equal parts. In my specimens many of the lower pinnæ are dichotomous; moreover, the fronds, which are larger than in Deplanche's or Balansa's gatherings, are light green, whereas Baker describes the fronds as being dark brown. It seems proper to name this form distinctively, the type of the species being regarded as the small brownish under-developed plant with simple lower pinnæ to which Baker's description applies.

H. ROLANDI-PRINCIPIS Rosenstock (ex descript.). Mt. Panié; creeping over rocks and trunks in forest; 4000 ft. 1822.

Franc's original plants, the subject of Rosenstock's description, were gathered in the same district—"in monte Tao, 700 m. alt." They were sterile, but Rosenstock described them as a species of *Hymenophyllum*. This now proves to have been correct, my specimens having a few typical sori, described below:— .... soris e pinnæ latere versus rhachidem solitatim oriundis, ellipticis, 2–2·5 mm. long. 1–1·5 mm. lat., horum labiis duobus equalibus, dimidio superiore apertis, minute denticulatis, receptaculo incluso.

HYMENOPHYLLUM SUBOBTUSUM Rosenstock (ex descript.). Ignambi; creeping over trunks in moist forest; 4000 ft.; rare. 1598. Franc's original specimens were collected in a neighbouring locality—"in monte Tao, 800 m. alt. 1421."

TRICHOMANES ALBUM Blume. Mt. Mou; on tree-trunks in cloud-forest; 3700 ft. 481. The New Caledonian plant occurs only at high altitudes. I put my gatherings into this species rather than in *T. pallidum* Blume, because of the cuneate-lanceolate pinnæ; *T. pallidum* is described as having cuneate-oblong pinnæ. Hooker and Baker reduce both species to one, *T. pallidum*.

Blume, who habitually mentions a montane habitat, states that his *T. pallidum* grows "in Javæ sylvis primævis," while *T. album* "crescit in Javæ montibus excelsis." It is probable that *T. album* would grow at a higher altitude in Java than in New Caledonia. Tropical Asia, Polynesia.

T. BAUERIANUM Endl. Mt. Panié; terrestrial in high forest; gneiss; 4000 ft. 1820. Malaya, Australia, Polynesia.

T. BIPUNCTATUM Poir. Ermitage Stream; 300 ft. Mt. Canala; near stream in forest; 1000 ft. Mt. Arago; creeping on earth among rocks by forest stream; 1000 ft. 181, 1163, 1429. Japan, Formosa, tropical Asia and Australia, Polynesia, S. and W. Africa.

T. CUNEATUM Christ. Mt. Mou; on tree-trunks in cloud-forest; 3800 ft. 614*a*. My specimens agree with Christ's description and figure, except that the frond is generally not truly dichotomous.

Christ's specimens come from "the top of Mt. Mou on rotten bark, very rare." Rosenstock's *Fil. Nov. Cal.* 51 is this species, collected by Franc on Mt. Mou at 1200 m. Thus, as in the case of *T. Francii* (which this species resembles in some respects), Mt. Mou is the only locality known at present.

T. DENTATUM van den Bosch. Mt. Arago; in damp stream-bed in forest; schists; 1000 ft. 1445. Polynesia.

T. DIGITATUM Swartz. Ignambi; on tree-trunks in cloud-forest; 3800 ft. 1650. Not hitherto from New Caledonia. The fronds are sparsely setose along the margins; occasional setæ are also present along the veins and along the margin of the involucre—a connecting-link with the var. *palmati-*

fidum C. Mueller. The fronds are rather small, reaching about 1·5 cm. in length including the stipe. Mascarene Islands, tropical Asia, New South Wales.

TRICHOMANES ELONGATUM Cunn. Mt. Mou; terrestrial; high forest; serpentine; 3800 ft. 496. Schlechter's 14796 from the Yahoué Mountains, sub nom. *T. dentatum*, is this species. New Zealand.

T. FERRUGINEUM van den Bosch. Presqu'île Bogota; frequent in scrubby *Spermolepis* woods on serpentine; 1000 ft. 1342. Curious little plants whose crown of coriaceous leaves is lifted off the ground, sometimes to the height of a foot, by a cylindrical meshwork of stiff black roots.

T. FLAVO-FUSCUM van den Bosch. Mt. Canala; high forest, climbing on tree-trunks; 3000 ft. Mt. Arago; high forest, climbing on trunks; 1000 ft. Ignambi; high forest, frequent on trunks; 3000–4000 ft. 1410, 1556. Prince Roland Bonaparte (in Sarasin and Roux, Nova Caledonia, Botan. i. 35) makes this a variety of *T. caudatum*, following Mettenius. It seems distinct enough to deserve specific rank.

T. FRANCII Christ. Mt. Mou; on tree-trunks in cloud-forest; 3800 ft. 614. The present is the only known locality. The plants described and figured by Christ, and Rosenstock's *Fil. Nov. Cal.* 14 (coll. Franc), all came from the summit of Mt. Mou.

T. MAXIMUM Blume. Mt. Canala; high forest; 2500 ft. 1217. Malaya, Polynesia, Queensland.

T. PELTATUM Baker. Ermitage Stream; clinging to tree-trunks in moist forest near stream; 300 ft. 800. Polynesia.

T. PUMILUM van den Bosch. Mt. Panié; under rocks in moist forest; gneiss; 1500 ft. 1784.

T. SAXIFRAGOIDES Presl. Ermitage Stream; 300 ft. Ignambi; streamside forest, forming large soft mats over gneiss boulders, interwoven with bryophytes; 1000 ft. 182, 1044, 1850. Java, Philippines, Melanesia, Fiji.

T. TRICHOPHYLLUM T. Moore. Ignambi; high forest; terrestrial in shelter of large gneiss boulders; 3000 ft. 1618. Borneo.

T. VIEILLARDII van den Bosch. Mt. Canala; on vertical rock-surface in forest-stream; schists; 2500 ft. 1209, 1535.

New Caledonian gatherings of this species are very uniform. I agree with van den Bosch and Fournier in regarding it as a distinct species, though Hooker and Baker unite it with *T. pyxidiferum* L.

CYATHEACEÆ.

Dicksonia Deplanchei Vieill. Mt. Mou; summit forest; serpentine; 3800 ft. 497.

D. straminea Labill. Mt. Mou; high forest; serpentine; 2000 ft. Mt. Arago; forest margin; mica schists; 1000 ft. 465, 1453. Polynesia.

D. thyrsopteroides Mett. Mt. Canala; forest margin; schists; rare; 1500 ft. Mt. Arago; edge of high forest; schists; occasional; 1000 ft. 1134, 1411.

Cyathea albifrons Vieill. var. lata Compton, var. nov. Varietas pinnulis oblongis obtusis 4–5 mm. lat. ad 12 mm. long., margine integro non crenato, soris utrinque usque ad 6, pinnæ fertilis parte distale $\frac{1}{3}$ vel $\frac{2}{3}$ sine soris.

Mt. Mou; high forest in gully; serpentine; 1500 ft. 464.

Differs from typical *C. albifrons* (as described by Fournier and in Hooker and Baker's 'Synopsis,' and as represented by specimens collected by Pancher, and by Schlechter 14841) in the broader ultimate pinnules, whose margins are entire and not crenate; and in the fewer sori, the distal part of the pinnules being without them.

C. neocaledonica Compton, sp. nov. *Arbor* trunco robusto usque 3 m. attingente. *Frons* horizontaliter expansa circa 1 m. long.; *stipes* rigidus, basi ramentis longis brunneis vestitus; *rhachides* omnium dilute brunnei teretes pube brevi brunnea vestiti; *lamina* tripinnata late elliptica; *pinnæ primariæ* erecto-patentes utrinque circa 6 alternatæ usque 20 cm. × 5 cm. attingentes; *pinnæ secondariæ* erecto-patentes utrinque circa 15 3–3·5 cm. long. 1·0–1·3 cm. lat.; *pinnulæ ultimæ* patentes in basi lato sessiles oblongæ obtusæ obscure crenulatæ coriaceæ lucentes in sicco atro-brunneæ costa media non prominente excepta glabræ squamoso-pilosæ, marginibus paullo revolutis, usque 9×3 mm.; *sori* submarginales, 4–7 globosi; *indusium* membranaceum pellucidum nullo colore fucatum ad apicem in lobos pannosos dehiscens; *sporangia* numerosa; *placenta* sphærica.

Ignambi; high forest; gneiss; 4000 ft. 1563.

Approaches nearest to *C. aneitense* from the New Hebrides, but differs in the shorter pinnules, broader ultimate segments, blunter apices, the shape of the frond, the erecto-patent pinnæ, the colour of the rhachis, etc. It is remarkable among tree-ferns for the relatively small, ungraceful, and coarse-textured fronds, which make it a singular associate of the arborescent filmy *Leptopteris Wilkesiana*, with which it grows in abundance in the summit cloud-forest of Ignambi.

CYATHEA VIEILLARDII Mett. Mt. Arago; margin of high forest; schists; 2000 ft. 1452. Rosenstock's *Fil. Nov. Cal.* 39 (coll. Franc on Mt. Dzumac), sub nom. *C. albifrons* (in Herb. Mus. Brit.), is this species.

ALSOPHILA DECURRENS Hook. Mt. Mou; in high forest; serpentine; above 3000 ft. 565. Polynesia.

A. NOVÆ-CALEDONIÆ Mett. Mt. Arago; high forest and along streams; schists; 1000 ft. Also at Mt. Canala. 1443. The only common Cyatheaceous fern in these schist forests; trunk sometimes 60 ft. high.

POLYPODIACEÆ.

DRYOPTERIS OBLIQUATA O. Kuntze. Ermitage Stream; high forest, near the water-side; cretaceous; 200 ft. 204.

D. PARASITICA O. Kuntze. Île Porc-Épic (E. Coast), abundant in forest; serpentine; 200 ft. 920. Tropical and sub-tropical, New Zealand, etc.

D. RECEDENS O. Kuntze. Tonghoué Mts.; sheltered hillsides in *Melaleuca* association below 1500 ft.; cretaceous. 172. More hairy than in typical *D. recedens* and rather resembling *D. velutinum* in this respect: from the latter species, however, it differs in having smaller ramenta extending several inches up the stipe. Southern India, Ceylon, Philippines.

D. SUBSERICEA O. Kuntze. Mt. Arago; very abundant in moist high forest; schists; 1000 ft. 1444. Also at Mt. Canala.

D. VIEILLARDII O. Kuntze. Ignambi; very abundant in high forest above 3000 ft.; gneiss. 1672.

ASPIDIUM KANAKORUM C. Chr. Mt. Canala; locally abundant in high forest; schists; 1500 ft. 1253.

A. SINUATUM Labill. Mt. Mou; streamside; serpentine; 800 ft. 446. Schlechter's 14902 and 15327 *a*, both sub nom. *Nephrodium dissectum*, are examples of this species.

DEPARIA MOOREI Hook. Paompai; high forest; shales; 100 ft. 1863.

POLYSTICHUM ARISTATUM Presl. Tonghoué Mts.; in hillside Niaouli association, below 1500 ft.; cretaceous. 173. Schlechter's exs. 14830 is labelled incorrectly *P. cristatum*. Japan, China, India, Malaya, Polynesia, Natal.

LEPTOCHILUS CUSPIDATUS C. Chr. Couliné, near Nékété; high forest, climbing on rocks; schists; 1000 ft. Paompai; locally abundant in high forest; shortly creeping over rocks or in shallow earth; 50–500 ft. 1281, 1910. Asia, tropical Australia, Polynesia, Seychelles.

LEPTOCHILUS VARIANS Fourn. Mt. Canala; 2500–3000 ft.; the rhizome clinging to trunks by roots and by twining; high forest. 1123, 1219.

DIPTERIS CONJUGATA Reinw. Mt. Koghi; sheltered part of Niaouli-*Gleichenia* association; serpentine; 1000 ft. Also on Mt. Canala; Niaouli association; schists; 1000–2000 ft.; and Mt. Panié; Niaouli association; gneiss; 1000 ft.; apparently spreading along tracks and in clearings. April. 750. Asia, tropical Polynesia.

NEPHROLEPIS CORDIFOLIA Presl. Mt. Mou; high forest about 1500 ft.; serpentine; common. Mt. Canala; high forest; 2000 ft.; abundant on stones and dead logs; schists. Ignambi; high forest; on rocks and trunks; gneiss; 1000–3500 ft. 434, 1227, 1677. Tropics, Japan, New Zealand.

SACCOLOMA MOLUCCANUM Mett. Ermitage Stream; high forest near stream; serpentine; 300 ft.; uncommon. Mt. Arago; high forest; very abundant; schists; 1500 ft. 200, 1433. Malaya, Polynesia.

DAVALLIA ALPINA Blume. Ngoye; on trunks by stream-side in high forest; 1500 ft. 1041. Malaya, Polynesia.

Schlechter's exs. 15155, sub nom. *D. serrata* Brack. from the same district, is this species.

D. CONTIGUA Spreng. Mt. Canala; on tree-trunks, among mosses; 1000 ft. Ignambi; creeping over rocks in high forest; 2500 ft. 1169, 1619. Schlechter's exs. 14910 (from the Paita Mts., 1250 m.) and 15672 (from the Oubatche Mts.—*i. e.*, the same locality as my own Ignambi gatherings) are this species, though labelled *Polypodium crassifrons*. Malaya, Polynesia.

D. MOOREI Hook. Plaine des Lacs; common in woods and high forest of valleys, above 800 ft.; serpentine. 365 *a*. Fiji.

D. PUSILLA Mett. Mt. Panié; creeping on trunks among bryophytes. R. Ngoye; on trunks in streamside forest; 1500 ft. 1794. Matches Schlechter's 15606, sub nom. *D. alpina*. Melanesia.

D. PYXIDATA Cav. Mt. Mou; streamside forest, on trunks; 600 ft. 539. Australia.

D. SOLIDA Sw. Mt. Mou; rock-crevices and dry hillsides in Niaouli association; serpentine; 1000 ft. Kuakué; in alluvial forest, climbing over rocks and up trees ; serpentine. Île Mouac ; abundant on ground at sea-level in Niaouli association ; schists. 515, 924, 2348. Malaya, Polynesia, Queensland.

Davallia tenuifolia Sw. Ignambi ; high forest, especially along tracks ; gneiss ; 2000–3500 ft. 1617. Japan, China, tropical Asia, Polynesia, Comoro and Mascarenes, Madagascar.

Lindsaya alutacea Mett. Pic la ; in rock-crevices and among sedges by stream-side, scrub area, frequent ; serpentine ; 500 ft. 863.

L. cheiroides Fourn. Mt. Mou ; on ground in moist gully, Niaouli region ; 800 ft. 541.

Great confusion exists in the nomenclature of this and related species. My specimen exactly matches plants at Kew and the British Museum collected at Wagap by Vieillard (1540). Now Vieillard 1540 from Mt. Dore was Mettenius's type-specimen for the name *L. nervosa* : but Mettenius's description of his *L. nervosa* clearly refers to a different plant from mine and from the Wagap specimen. Further, Fournier quotes Balansa 2694 as *L. nervosa* along with Vieillard's 1540 from Mt. Dore ; but the Balansa 2694 which I have seen is not the same plant as Vieillard 1540 from Wagap. I therefore conclude that Vieillard's two gatherings from Wagap and Mt. Dore were united under one series-number in error, though I have not been able to see the Mt. Dore specimens. Fournier's *L. cheiroides* seems to have been identical with my plant, and this opinion is shared by Rosenstock (*Fil. Nov. Cal.* 33, coll. Franc) and by Christ (Bonati exs. 365, coll. Franc).

L. deltoidea C. Chr. Ermitage Stream ; streamside forest ; serpentine ; 300 ft. 209. New Hebrides.

L. McGillivrayi Carruth. Nekando ; in *Spermolepis* forest ; serpentine ; 500 ft. 990. My specimens match McGillivray's F. 16 in Herb. Kew. The specimen in Herb. Mus. Brit. is larger and corresponds more closely with Hooker and Baker's description.

L. neocaledonica Compton, sp. nov. *Rhizoma* sub solo vigens, elongata horizontalis ramenta brunnea tenuia ferens. *Stipes* 50 cm. long. basi teres ramentis paucis instructus superne quadrangulus glaber, subrubicundus. *Frons* bipinnata : *pinnæ* suboppositæ subcontiguæ patentes inferiores 19 × 4 cm. superiores 11 × 3 cm. : apex producta, apicem versus sensim angustior dentataque : segmentum terminale pinnulis 14 × 3 cm. instructum. *Pinnulæ* contiguæ breviter petiolulatæ adiantiformes ovato-quadratæ saturate virides tenues sed non pellucidæ intermediæ 15 × 10 mm. interdum 18 mm. long., margo posterior rectus vel paullo recurvatus integer : margo interior

rectus rhachi approximatus integer: margines anterior exteriorque crenulati vel paullo lobati, soris subcontinuis instructi; venatio flabellata, sæpius dichotoma, costa media carente.

Mt. Koghi; forest; serpentine; 1500 ft 791.

A large and handsome species of the alliance of *L. McGillivrayi.*

Lindsaya prolongata Fourn. Ignambi; terrestrial in forest; gneiss; 3500–4250 ft. 1607.

I have not seen Fournier's type-specimens, viz., Balansa 1602 and F. Muell. (part); and Rosenstock's *Fil. Nov. Cal.* 11 is partly *L. prolongata* and partly *L. neocaledonica* (example in Herb. Mus. Brit.). My determination rests on Christ's determination of a plant collected by Franc in the forests of the Baie du Sud and distributed as Bonati 679.

L. Vieillardii Mett. Mt. Panié; abundant in high forest; terrestrial; gneiss; 1500 ft. 1829.

Var. serrata Compton, var. nov. Margo pinnæ fertilis acute irregulariter serratus ubi sorus continuus est, frons tenuior et pinnæ fertiles paullo breviores quam in typo.

Mt. Panié; locally frequent in high forest; gneiss; 1500 ft. 1765.

In the type, *L. Vieillardii,* the margin of the fertile frond is only serrate where there is no sorus, or where the sorus is interrupted: in the variety *serrata* the margin is serrate whether a sorus is continuous or not.

Blechnum orientale Linn. Paompai; by streams in Niaouli region; shales; 1500 ft. 1895. Tropical Asia, Australia, and Polynesia.

Lomaria attenuata Willd. Mt. Canala; high forest, on rocks; schists; 2000 ft. 1234. South Africa and islands, New South Wales, Polynesia, Juan Fernandez, ? Chile.

Forma monstrosa Compton, form. nov. Mt. Arago; wet forest; rhizome climbing trunks; 1500 ft. 1430.

A remarkable form, evidently abnormal. Baker (Syn. 70) mentions that the pinnæ of *L. attenuata* "are occasionally obliterated and we have an entire lanceolate frond like that of *L. Patersoni.*" My specimen has fronds partially lobed and partially entire, thus forming a connecting-link between the extremes.

L. ciliata T. Moore. Ermitage Stream; on rocks along the water's edge; serpentine; 300 ft. Mt. Canala; locally abundant in intermediate forest; schists; 2000 ft. 198, 1252.

L. contigua Fourn. Mt. Mou; shortly climbing trunks in high forest; 2500 ft. 571.

LOMARIA DEPLANCHEI Baker. Mt. Mou; high forest; terrestrial; serpentine; 2500 ft. 570. Rosenstock's *Fil. Nov. Cal.* 45, sub nom. *Blechnum opacum*, is *Lomaria Deplanchei* (collected by Franc on Mt. Mou).

L. DIVERSIFOLIA Baker. Mt. Panié; abundant on ground in high forest; gneiss; 1500 ft. 1783.

L. GIBBA Labill. Mt. Koghi, Mt. Mou, Taom, etc.; common by streams in forest areas all over New Caledonia. Shortly arborescent, the trunk reaching three or four feet in height. New Hebrides.

L. LENORMANDI Baker. Ignambi; frequent in high forest; gneiss; 4000 ft. 1562.

Forma APRICA Compton, form. nov. The fronds are reduced in size and firmer in texture, closely resembling those of *L. diversifolia*, from which it differs in the tomentose rhachis.

Ignambi; in a clearing, the type being at hand in the forest; 4250 ft. 1562*a*.

I suspect that *L. diversifolia* var. *paleaceo-setosa* Rosenstock (in Fedde, Repert. x. 75, coll. Le Rat on Mt. Poindimié) is really this reduced *L. Lenormandi*, which owes its special characteristics to growth in open situations.

L. OBTUSATA Labill. Plaine des Lacs; in stream-bed in forest; serpentine; 1000 ft. 357. New Hebrides.

L. OPACA Fourn. Mt. Canala; wettest parts of high forest; terrestrial; schists; 2000–3000 ft. 1231.

My specimens agree with Mettenius's original description (sub nom. *Blechnum opacum*) and match his type-specimen, Vieillard 1533. The description in Hook. & Bak. Syn. 176 (which is the first use of the combination *Lomaria opaca*) does not apply to these specimens. Rosenstock's *Fil. Nov. Cal.* 45, sub nom. *B. opacum*, has no anastomosing veins and differs from his species in other respects; it is *L. Deplanchei* Baker. Polynesia.

L. PROCERA Spreng. Mt. Mou; forest margin; serpentine; 3500 ft. Ignambi; abundant in moister parts of high forest; gneiss; 3000 ft. 572, 1706. South Africa, Perak, ? Malaya, Polynesia, ? Tropical America, etc.

L. VIEILLARDII Baker. Mt. Canala; among rocks by stream in high forest; schists; 1500 ft. Mt. Arago; abundant by stream-side in high forest; schists; 800 ft. 1189, 1405.

Var. SIMPLEX Fourn. Ouendjam Forest; abundant near stream; shales; 500 ft. 1990. It seems likely that this is the plant referred to by Fournier as var. *simplex*, with simple linear fertile fronds resembling those of *Lomaria Patersoni*: I have not, however, seen his type-specimen, Balansa 1571. I maintain this variety, which seems to be locally constant. In other respects it is certainly to be related to *L. Vieillardii*, and not to *L. Patersoni*, an Australian species to which it bears a resemblance in the simple sterile and fertile fronds.

DOODIA CAUDATA R. Br. var. LINEARIS J. Sm. (pro sp.). Mt. Dore; stream-valley forest; serpentine; 800 ft. 674. Australia, New Zealand.

D. MEDIA R. Br. Mt. Mou; high forest in gully; cretaceous; 600 ft. 535. I cannot distinguish *D. Kunthiana* Gaudich., under which name the New Caledonian plants have often been recorded. Australia, New Zealand, Polynesia.

ASPLENIUM ADIANTOIDES C. Chr. Ermitage Stream; streamside forest; serpentine; 300 ft. 212. Tropical Asia, Polynesia and Australia, New Zealand, S. Africa.

Var. TRIPINNATA Compton, var. nov. Varietas frondibus tripinnatis, *pinnis* utrinque circa 25, basalibus longissimis. *Petiola* pinnarum basalium 0·7–1·0 cm., *lamina* 15–20 cm. long. *Pinnulæ* obliquæ, breviter petiolulatæ maximæ 8 × 2 cm., longe attenuatæ, basi ad rhachin divisæ in lobos alternatos ovato-cuneatos apice serratos.

Mt. Mou; forest in gully; cretaceous; 600 ft. 537.

Closely resembling *A. adiantoides* in texture, nervation, and hairiness; its more distant pinnules are very similar to the pinnæ of the type.

A. ATTENUATUM R. Br. Mt. Mou; on steep rocks and crevices in damp gully; cretaceous; 600 ft. 538. The first record from New Caledonia. E. Australia.

A. CUNEATUM Lam. Mt. Mou; streamside forest; cretaceous; 600 ft. Ignambi; occasional; gneiss; 1500 ft. 536, 1676. Tropics.

Var. PROLIFERUM R. Bonaparte. Mt. Canala; among rocks and on trunks in moist high forest; schists; 2500 ft. 1228. From the same locality as the original specimens collected by Sarasin and Roux.

A. LASERPITIIFOLIUM Lam. Mt. Koghi; on rocks in sheltered stream-valley forest; serpentine; 1000 ft. 762. Malaya, Polynesia, tropical Australia.

A. MERTENSIANUM Kunze. Mt. Mou; on ground in high forest; serpentine; 1500 ft. Mt. Humboldt; on ground in high forest; serpentine; 500 ft. 564, 1043. Western Polynesia.

ASPLENIUM NIDUS Linn. Abundant everywhere in lowland forest, on tree-trunks and rocks, throughout New Caledonia and the Isle of Pines. Tropical Asia, Polynesia and Australia, E. Africa.

A. NOVÆ-CALEDONIÆ Hook. Mt. Mou; on ground in valley-forest; 1500 ft. Kuakué; rock-crevices near river; 50 ft. Mt. Humboldt; stream-side in high forest, among stones; 1000 ft. R. Ngoye; in rock-crevices near river and along streams; 400 ft. Taom; among rocks in open scrub. All on serpentine; 1000 ft. 432, 952, 1031, 2063, 2306. The fronds vary greatly according to situation; sometimes they are long, soft, and drooping, sometimes short and stiffly erect, according as the plants are growing on the ground in moist forest conditions, or in rock-fissures in exposed situations.

A. OBLIQUUM Forst. Mt. Canala; on rocks in high forest; scarce; schists; 2000 ft. R. Ngoye; in *Spermolepis* forest near river; in hollows of tree-trunks; 400 ft. 1229, 2101. Australia, New Zealand, Antarctic Islands, S. Chile.

Var. INTEGRA R. Bonaparte (pro sub-var.). Mt. Humboldt; high forest by stream-side; serpentine; 1000 ft. 1006. Sarasin and Roux, as well as Balansa, also collected this fern on Mt. Humboldt; my notes refer to it as the common form in this district. It seems definite enough, therefore, to be regarded as a, possibly local, variety.

Prince R. Bonaparte mentions Fournier as the authority for the name *integra*. Fournier, however, merely writes: "S-var. frondibus integris v. ternatis (junius). Messioncoué pr. montem Humboldt, 700 m. (Bal. 855)."

A. POLYPHYLETICUM Compton, sp. nov. *Rhizoma* copiose radicans, ramentis linearibus acuminatis fusco-brunneis indutum, primo gracile et frondes steriles inter se satis distantes gerens, deinde crassior et apice frondibus fertilibus majoribus approximati instructum. *Frons* adulta lanceolata bipinnata circa 60 cm. long. 18 cm. lat.; *rhachis* basi copiose ramentifera alibi sparsim, fusco-brunnea; *pinnæ* 20–30-jugæ, paucæ basales mediocriter distantes, ceteræ approximatæ, angulo circo 60° ex rhachi orientes plus minus apertæ arcuatæ æqualiter pinnulatæ, pinnulæ proximales apice 2–3-fidæ, distales integræ lineari-oblongæ acutæ, frondum sterilium semitranslucentes leviter crispatæ, frondum fertilium subopacæ glabræ saturate virides, quæque margine exteriori soro unico apicem vix attingente instructa.

Mt. Canala; forest, creeping over ground and climbing trunks; schists; 2000–3000 ft. Mt. Arago; moist forest, climbing on rocks and trunks; 1000 ft. 1125, 1440.

This puzzling Asplenium matches Vieillard 1569, which Mettenius determined as *A. nodulosum* Kaulf. forma *b*. It appears to have nothing to do with

A. gemmiferum var. *flexuosum* or *discolor*, and it does not agree with Rosenstock's description of *A. subflexuosum*. The fronds of my plant seem to be always bipinnate, and I can find no character to separate them from the geographically far-removed *A. nodulosum* var. *bipinnatisectum* forma *b* of Mettenius. I have described it as a distinct species on the ground of its climbing habit, its constancy of character (*A. nodulosum* is extremely variable), the translucent slightly crispate sterile fronds, and the geographical position.

ASPLENIUM PRÆMORSUM Sw. Mt. Mou; open stony hillsides in slight shelter; serpentine; 2500 ft. Mt. Humboldt; high forest; serpentine; 500–2500 ft. Frequently also in the "nests" of *A. nidus*. 577, 1042. Tropics and subtropics.

This fern varies greatly according to its situation. In the exposed form from Mt. Mou the fronds are short, hard in texture, and less cut. The forest-form from Mt. Humboldt has long drooping fronds of softer texture, which are more deeply cut. These forms are connected by a great range of intermediates.

A. TENERUM Forst., var. NEOCALEDONICA Rosenstock. Mt. Koghi; creeping over dead logs and tree-fern trunks near stream; 1000 ft. 763. From the same locality as the type-specimen, Rosenstock 95, coll. Franc. The species occurs in S. India, Ceylon, Malaya, Seychelles, tropical Asia, Polynesia.

A. VIEILLARDII Mett. Tonghoué Mts.; in high forest of sheltered valleys; cretaceous; 800 ft. 174. Fiji.

DIPLAZIUM MAXIMUM C. Chr. var. SORORIUM Mett. (pro sp.). Mt. Canala; high forest, especially by stream-sides; schists; 1000 ft. 1170. A tree-fern with a trunk about four feet high and large thin sciaphilous leaves. China, tropical Asia, Australia, and Polynesia.

DIPLAZIOPSIS JAVANICA C. Chr. Mt. Canala; abundant in the ground-association of the moistest parts of the high forest; schists; 1500 ft. 1182. Slightly arborescent, trunk about one foot high, leaves large, thin, and sciaphilous. Associated with *Diplazium maximum* var. *sororium*, *Dicksonia straminea*, and *Leptopteris Wilkesiana* in a low tree-fern sub-association.

S. China, N. India, Malaya, Polynesia.

GYMNOGRAMME DECIPIENS Mett. Mt. Canala; on mossy rocks in high forests; schists; 2000 ft. Mt. Arago; locally abundant in high forest, especially near streams; schists; 1000 ft. Ignambi; clayey earth; locally frequent in high forest; gneiss; 3000 ft. Tonine; high forest; hornblende; 2000 ft. 1230, 1415, 1708, 1945. Western Polynesia. The Tonine specimens were frequently viviparous.

Var. PARVA Compton, var. nov. Minor, *fronde* stricte lanceolata, ad 16 × 2·5 cm. *Pinnæ* quam in typo disjunctiores, basales segmentibus 1 vel 2 margine superiore pæne usque ad rhachin sectæ. *Sori* 1–3, longitudine vix latitudinem duplo, 1–2 mm. long.

Mt. Panié; abundant creeping over rocks in mountain streams; gneiss; 1500 ft. 1781.

GYMNOGRAMME MARGINATA Mett. Ignambi; local on the ground in moist forest; gneiss; 2000 ft. 1722.

SYNGRAMME FRANCII Rosenstock (ex descript.). Mt. Panié; terrestrial and epiphytic in forest; gneiss; 1500 ft. 1780. The locality is the same as that in which Franc collected the type-material.

PELLÆA FALCATA Fée. Ermitage Stream; among stones by waterside; uncommon; serpentine; 300 ft. 214. Tropical Asia, Australia, Tasmania, New Zealand.

CHEILANTHES SIEBERI Kunze. Mt. Mou; damper parts of Niaouli zone, cretaceous; 1000 ft. Mt. Dore; abundant on stony hillsides, scrub association; serpentine; 0–1000 ft. Mt. Canala; frequent in Niaouli-*Gleichenia* association; schists; 1500 ft. 516, 673, 1129. Australia, New Zealand.

ADIANTUM DIAPHANUM Blume. Ermitage Stream; rock-crevices near waterfall; high forest; serpentine; 300 ft. 196. Tropical Asia, Polynesia, Australia, New Zealand.

A. FULVUM Raoul. Ermitage Stream; common in forest near edge of stream; serpentine; 3000 ft. 210.

A. HISPIDULUM Sw. Paompai; rocky stream-sides in forest; shales; 100 ft. 1911. S. India, Malaya, Polynesia, S. Africa.

A. NOVÆ-CALEDONIÆ Keyserling. Mt. Mou; gully forest; serpentine; 1500 ft. 437.

PTERIS ENSIFORMIS Burm. f. Mt. Mou; high forest; cretaceous; 600 ft. Île Porc-Épic (E. coast); among rocks in forest; frequent; serpentine; 200 ft. Paompai; dry parts of forest and in coffee plantations; shales; 100 ft. 623, 919, 1886. China, N. India, Malaya, Polynesia, and tropical Australia.

P. INCISA Thunb. var. AURITA Luerss. Ermitage Stream; forest margin and among rocks by stream-side; serpentine; 300 ft. 195. Tropics and sub-tropics, Antarctic islands.

PTERIS RUGOSULA Labill. Mt. Mou ; forest ; serpentine ; 3600 ft. 495. Philippines, Tahiti (?).

My plant belongs to the var. *major* Fourn. (sub *Cheilanthes rugosula* Fourn.), having the lowest pinnæ more than a foot long.

P. VIEILLARDII Mett. forma FURCATA Compton, form. nov. Ignambi ; high forest, especially where better lighted ; gneiss ; 2500–4000 ft. 1576. The typical form of this species has three leaflets (Vieillard 1565, McGillivray F. 31, Pancher). In this new form each of the three leaflets forks once or twice, the ultimate segments being as large as those in the ordinary ternate form ; the fronds reach 60 cm. in height. It is apparently due to luxuriance in favourable conditions.

PTERIDIUM AQUILINUM Kuhn var. ESCULENTA Forst. (pro sp.). Tonghoué Mts. ; Niaouli association ; cretaceous ; 1000 ft. Abundant on nearly all soils, often dominant on serpentine hillsides, and forming a chief constituent of the undergrowth in dry Niaouli country. Australian region.

VITTARIA ENSIFORMIS Sw. Ignambi ; epiphytic and on the adventitious roots of climbing ferns in high forest ; gneiss ; 3000 ft. 1699. Java, Mascarenes.

V. RIGIDA Kaulf. Kuakué; forest ; sea-level ; in tufts on vertical trunks. 929. Malaya, Polynesia.

V. ZOSTERÆFOLIA Bory. Mt. Humboldt ; high forest by stream-side ; epiphytic ; 500–1000 ft. Cap Bocage ; high forest ; epiphytic ; 50 ft. Ignambi ; high forest ; epiphytic ; 1000 ft. Paompai ; high forest ; in old "nests" of *Asplenium nidus* ; 500 ft. 1039, 1367, 1630, 1891. Mascarenes and Comoros, Malaya, Polynesia.

ANTROPHYUM LATIPES Kunze. Tonine ; forest ; epiphytic ; 2500 ft. 1971.

A. PLANTAGINEUM Kaulf. Paompai ; on vertical rocks and trunks near streams ; shales ; 100 ft. 1873. N. India, Ceylon, Malaya, Polynesia.

A. SEMICOSTATUM Blume (ex descriptione). Mt. Canala ; on fallen logs in moist forest ; 1000 ft. 1268. Ceylon, Malaccas, Malaya, Polynesia. The fronds are rather narrower than usual ; the midrib is evident, blackish, and reaching about halfway along the frond.

HYMENOLEPIS OPHIOGLOSSOIDES Kaulf. Mt. Arago ; streamside trees ; occasional ; 1000 ft. Ignambi ; streamside forest ; 1000 ft. Ouendjam Forest ; riverside ; 500 ft. Epiphytic. 1431, 1616, 1991. Madagascar, Mascarenes, tropical Asia, Australia, and Polynesia.

POLYPODIUM BROWNII Wickstr. Mt. Humboldt; frequently climbing over trunks in streamside forest; 1000 ft. 1034. Australia, Fiji.

P. CUCULLATUM Nees & Blume. Mt. Mou; on tree-trunks in cloud-forest; 3700 ft. Ignambi; on rocks by stream; gneiss; 3000 ft. 483, 1533. Ceylon, Malaya, Fiji.

My specimens apparently belong to the f. *minor* Fournier. A minute and remarkable plant; the small fertile pinnæ are folded lengthwise over the solitary sori, the sterile pinnæ being flat.

P. DEPLANCHEI Baker. Mt. Mou; high forest; epiphytic; 2500 ft. Ignambi; high forest; creeping on tree-trunks; 4000 ft.. 578, 1659.

P. GLABRUM Mett. Tonghoué Mts.; creeping over rocks by stream; cretaceous; 500 ft. Mt. Mou; climbing up trunks in forest margin and Niaouli association. 169, 447. Australia, Lord Howe and Norfolk Islands, New Zealand.

The New Caledonian material I have seen has the fronds not dimorphic, some inches long, and lacking ferruginous tomentum; in these respects it differs from *P. confluens*, to which Prince Roland Bonaparte and Schlechter refer New Caledonian gatherings.

P. LANCEOLA Mett. Mt. Mou; on trunks in conifer forest; 3500 ft. Ignambi; on trunks in conifer forest; 3500 ft. Ignambi; on trunks in high forest; 3500 ft. Mt. Panié; on mossy bark in forest; 1500 ft. 494, 1564, 1786.

I cannot agree with Fournier's subdivision of this species (*Selliguea lanceola* Fourn.) into three varieties—*selligueoides*, *intermedia*, and *polypodioides*; all these states can be found on the same individual, as my specimens show. Schlechter 14998, issued as *P. lanceola*, is *P. Brownii* (Herb. Mus. Brit.).

P. LASIOSTIPES Mett. Plaine des Lacs; stream-bed in gully forest; serpentine; 1300 ft. Comboui-Ngoye watershed; on trunks in *Casuarina* forest; 3000 ft. 299, 1004.

P. PHYMATODES Linn. Mt. Mou; forest-margin; cretaceous; 1000 ft. Île Mouac; maritime cliffs; schists. 466, 2390. Tropics of the Old World.

P. PSEUDAUSTRALE Fourn. Mt. Mou; high forest; on tree-trunks; 3500 ft. 629.

Fournier described this fern as *Grammitis pseudaustrale* in 1869; in 1873 he included it in the genus *Polypodium*. This is the *P. nanum* Vieill. (H. B. Syn. p. 507), as appears from the description and from Vieillard's specimens. As the name *P. nanum* already existed (Fée, Gen. 238, 1850–2), the earliest tenable specific name is *pseudaustrale*; there was no need for the subsequent coining of *P. pumilio* Hieron. (under which name Rosenstock has issued *Fil. Nov. Cal.* exs. 46).

POLYPODIUM PUNCTATUM Sw. Paompai; on rocks by shady stream; shales; 200 ft. R. Comboui; on trunk in *Callitris* forest, near river; 400 ft. Isle of Pines; very abundant on ground in banyan forest; coral. 1881, 2197. Tropics of Old World, Polynesia.

When terrestrial the fronds are two feet long, rising vertically from the soil, and are almost covered with the minute sori; as an epiphyte they are much shorter and the sori are confined to the distal part.

P. VIEILLARDII Mett. Plaine des Lacs; on bases of trunks in kaori forest; 800 ft. Mt. Mou; on rocks in damp gully; cretaceous; 800 ft. Mt. Canala; in crevices of bark; high forest; 2500 ft. 397, 542, 1124.

Pancher's plant under this name in Herb. Mus. Brit. is *P. Deplanchei.*

DRYNARIA RIGIDULA Bedd. Tonghoué Mts., Ermitage Stream, Mt. Mou, Isle of Pines, etc.; up to 1500 ft.; epiphytic. 213. Tropical Asia, Australia, and Polynesia.

ELAPHOGLOSSUM IGNAMBIENSE Compton, sp. nov. Planta epiphytica. *Rhizoma* super arborum truncos breviter repens, radicibus adventitiis dense vestitum. *Frondis sterilis stipes* 2–5 cm. long. 2 mm. lat.; *lamina* oblongo-elliptica circa 15 cm. long. × 4 cm. lat. rigida coriacea opaca glabra mediocriter viridis, apice rotundato-obtusa, basi in stipite attenuata; *costa media* pallida ad apicem haud attingens; *venulæ laterales* angulo 60° exgredientes, non vel simpliciter furcatæ, marginem laminæ attingentes. *Frons fertilis* similis, *stipes* circa 10 cm. long., lamina 10 × 3·5 cm. facie inferiore margine et partibus laminæ ad costam mediam approximatis exceptis, sporangiis dense vestita.

Ignambi; frequent in forest, creeping over tree-trunks; 3000–4250 ft. 1565.

Belongs to the same group as *E. conforme* Schott, *E. feejeense* Brack., and *E. Vieillardii* T. Moore, but is sufficiently distinct therefrom to merit separate treatment. I have been unable to match my specimens at Kew or the British Museum. From *E. Vieillardii* it differs in having the fertile and sterile fronds approximately equal in length (though the proportion of stipe and lamina is different), and in the distinctly thickened margin and the thicker substance of the lamina.

E. NEOCALEDONICUM Compton, sp. nov. *Rhizoma* breviter repens radicibus dense vestitum. *Frondes steriles* opacæ saturate virides rigidæ in saxis procumbentes; *stipes* 5–10 mm. long. 1 mm. diam., paucis ramentis tectus;

lamina e basi sensim ampliata obovata apice rotundata usque ad 9 × 3·5 cm., margine recurvata, costa media usque ad 5 mm. ab apice manifesta, venæ laterales angulo acuto egredientes semel bisve furcatæ, facies superior glabra, inferior ramentorum fasciculis parvis inspersa. *Frondes fertiles* erectæ; *stipes* usque ad 9 cm. attingens, sensim in laminam transiens, lamina oblongo-lanceolata, obtusa 5–6 × 1–1·7 cm., subtus omnino sporangiis tecta.

Ignambi; abundant on gneiss boulders, along streams; 3500 ft. 1612.

Related to *E. Franci* Rosenstock, but differs chiefly therefrom in the different size and proportions of its parts.

ELAPHOGLOSSUM VIEILLARDII T. Moore. Mt. Humboldt; among logs and stones in moist forest near stream; serpentine; 1000 ft. 1030. Fiji.

GLEICHENIACEÆ.

STROMATOPTERIS MONILIFORMIS Mett. Plaine des Lacs; frequent in clayey ferruginous soil; open *Dacrydium* association; serpentine; 800–2000 ft. Nekando; in undergrowth of *Spermolepis* forest (shade form); 300 ft. Presqu'île Bogota; serpentine scrub; 1500 ft.; etc. 313, 989.

Endemic: a monotypic genus.

For the first time the existence is recorded of a horizontal rhizome, buried in the soil to a depth of 3–4 inches, and giving off erect branches which fork repeatedly in an irregular fashion. Roots are borne sparsely on this horizontal rhizome. Hitherto the existence of horizontal rhizome and roots has been denied.

GLEICHENIA FLABELLATA R. Br. Mt. Mou; dry scrub; serpentine; 2000 ft.; damp gully by stream; cretaceous; 600 ft. Mt. Arago; dry *Melaleuca* association; occasional with *G. linearis*; schists; 2000 ft. 428, 540, 1454. Australia, Tasmania, New Zealand.

Rosenstock's *Fil. Nov. Cal.* exs. 60 is this species with elongate ligulate pinna-tips; it is issued as *G. flabellata* forma *prolifera*. This name does not appear to have been published with description, but is used by Prince Roland Bonaparte (in Sarasin and Roux, Nova Caledonia, B. i. 49). My No. 428 is this forma. 540 has some pinnæ "proliferous," others not, all on the same frond.

G. MONTAGUEI Compton, sp. nov. *Rhizoma* in solo repens 2 cm. diam. terete durissimum protostelicum. *Frondes* distantes 5–6 m. long., juventute ramentis brunneis lanosis et squamosis omnimodo vestitæ; *stipes* basi erectus, 2 cm. diam., supra sensim tenuior teres durus glaber utrinque pinnas pinnato-flabelliformas distantes ferens; *pinnæ primi ordinis* expansæ, rhachi producto, pinnulas oppositas pseudo-dichotomas ferentes; *pinnulæ* ter furcatæ; laminæ ex segmentis ultimis penultimisque angulo 70°–80° egredientes divaricatæ contiguæ in basi lato sessiles oblongæ interdum apice paullo dentatæ, 10–15×3 mm., supra lucentes subtus leviter glaucescentes margine plana, venulæ ultimæ ad rhachin furcatæ. *Sori* parvi superficiales 10–15-jugi, in venulis solitarii. *Sporangia* 3–5, cum ramentis intermixta.

Ignambi; high forest; gneiss; 3000 ft. 1727.

A member of the § Mertensia. It has the largest rhizome and frond of any known species of *Gleichenia*. The frond, which is stiffly erect at the base and arches over above, shows no climbing habit and may reach 20 ft. in length; it gives off to right and left large flabellately branched pinnæ, which spread out flat at right angles to incident light.

G. Montaguei appears to be closely related to *G. Cunninghami* from New Zealand, from which however it differs in the remarkable size of its rhizome and stipe which are $\frac{3}{4}$ inch in diameter; the largest rhizome of *G. Cunninghami* I have seen (coll. Horne, Bay of Islands, New Zealand, in Herb. Mus. Brit.) is only $\frac{1}{6}$ inch in diameter. *G. Montaguei* also appears to be related to an unnamed *Gleichenia* from the Sogeri region of New Guinea (coll. Forbes 923 in Herb. Mus. Brit.), which has a similar habit and mode of branching, and which has unusually large rhizome and stipe (though smaller than those of *G. Montaguei*). I dedicate this species to the memory of my friend Paul Denys Montague, my fellow-worker in New Caledonia.

GLEICHENIA CIRCINATA Sw. Mt. Mou; forming dense thickets above 2000 ft. in open situations; serpentine. Australia, Tasmania, New Zealand, Borneo, Malacca.

G. LINEARIS C. B. Clarke. Abundant in dry sunny situations on all rocks throughout the country. Tropical and subtropical regions; New Zealand.

SCHIZÆACEÆ.

SCHIZÆA BIFIDA Sw. Mt. Canala; on ground in Niaouli association; schists; 1000 ft. 1250. Australia, New Zealand.

S. DICHOTOMA Sm. Plaine des Lacs; common in serpentine scrub; 1000 ft.; on ground in valley forest; serpentine (shade form); 1600 ft. Kuakué; among rocks; serpentine; sea-level. Couliné; forest; serpentine; 1000 ft. Ignambi; forest; gneiss; 3000 ft. Île Mouac; Niaouli association; schists; sea-level. 336, 354, 925, 1280, 1698, 2350. Tropical Asia, Australia and Polynesia, Madagascar, and Mascarenes.

I follow Luerssen in including *S. Forsteri* Spreng. in this very variable species, whose differences are chiefly in luxuriance, following a considerable range of habitat.

SCHIZÆA FISTULOSA Labill. Presqu'île Bogota ; occasional on dead logs in humus in *Spermolepis* and *Casuarina* forest ; serpentine ; 1000 ft. Ignambi ; on ground in Niaouli association ; gneiss ; 3500 ft. 1341, 1541. Tasmania, New Zealand, antarctic America, Borneo, Madagascar.

The Bogota plant, grown in shade, is unusually tall, the frond being 18 inches in length ; there are about 30 fertile segments on each side of the spike.

S. INTERMEDIA Mett. River Ngoye ; streamsides in forest shade ; serpentine. 973.

Schlechter 15336, in Herb. Brit. Mus., issued as *S. intermedia*, has a broad frond and glabrous sporophylls and should probably be regarded as a variety of *S. lævigata* ; the fronds are too long for *S. plana* Fourn. *S. intermedia* Mett. has ribbon-shaped carinate fronds, 2 mm. broad, and the sporophylls are hairy.

Rosenstock's *Fil. Nov. Cal.* exs. 118 (coll. Franc), distributed as *S. lævigata*, belongs here.

S. LÆVIGATA Mett. Baie Ngo ; dry serpentine scrub ; 500 ft. 247.

LYGODIUM HIANS Fourn. Nekando ; conifer forest ; twining by elongated rhachis to height of 10 ft. ; serpentine ; 3500 ft. Ignambi ; high forest ; twining ; gneiss ; 3500 ft. Mt. Panié ; forest ; gneiss ; 3000 ft. 1069, 1540, 1810.

In this remarkable species certain of the fronds are dichotomous and definite in growth ; in others the rhachis goes on growing indefinitely, twining round branches of shrubs and bearing lateral dichotomous leaf-segments, some sterile, others fertile ; the elongated rhachis being evidently a sympodium. On Mt. Panié a witches' broom gall is frequently present (1810).

L. RETICULATUM Schkuhr. Tonghoué Mts. ; very common climbing over shrubs and trees ; cretaceous ; 500 ft. Baie Ngo ; on stream flood-plain ; serpentine ; 50 ft. Mt. Mou ; abundant in Niaouli association ; cretaceous ; 800 ft. Kuakué ; river flood-plain ; serpentine ; 50 ft. ; etc., etc. 171, 244, 445. Polynesia, Australia.

OSMUNDACEÆ.

LEPTOPTERIS WILKESIANA Christ. Mt. Canala ; locally abundant in damp parts of high forest ; schists ; 2000 ft. Ignambi ; abundant in moist forest ; gneiss ; 4000 ft. 1205, 1560. New Guinea, Polynesia.

The trunk of this arborescent filmy fern sometimes reaches 10 ft. in height, frequently being bent.

SALVINIACEÆ.

AZOLLA sp. indet. Mt. Mou ; stagnant pools ; 500 ft. 558.

MARATTIACEÆ.

ANGIOPTERIS EVECTA Hoffm. Ermitage Stream ; streamside in high forest ; serpentine ; 600 ft. Ignambi ; locally frequent in high forest, especially in moister parts ; gneiss ; 2500 ft. 202, 1536. Tahiti, tropical Africa and Asia.

MARATTIA ATTENUATA Labill. Mt. Arago ; high forest ; schists ; 2000 ft. Mt. Panié ; high forest ; gneiss ; 1500 ft. 1451, 1770.

The bipinnate fronds are relatively small, being 4–5 ft. long, and the number of pinnæ is restricted, often only four being present. My specimens agree well with Labillardière's original description and drawing (Sert. Austrocal. tt. 13, 14 ; 1824).

M. FRAXINEA Sm. (in sens. strict. De Vriese). Ignambi ; frequent in forest ; gneiss ; 2000 ft. 1490. Tropical Asia, Africa, and Australia.

Schlechter 15052 in Herb. Mus. Brit., sub nom. *M. fraxinea*, is *Angiopteris* sp.

M. SMITHII Mett. Mt. Arago ; abundant here and at Mt. Canala ; moist forest ; schists ; 1000 ft. 1442. Polynesia.

The fronds are 18–20 ft. long, with a stipe as thick as a man's arm.

Forma SOLUTA Compton, form. nov. Ignambi ; forest ; gneiss ; 1500 ft. 1674.

An abundant form in this locality, where very favourable conditions produce luxuriant growth. The secondary pinnules show all transitions from entirety through partial pinnatifission to a completely pinnate condition, *i.e.* the frond is bi-tripinnate. (The tripinnate condition is normal in *M. pellucida*, also recorded from New Caledonia.)

M. TERNATEA De Vriese. Ermitage Stream ; by streamside in forest ; serpentine ; 600 ft. 201. Moluccas.

Bonati 142 *bis* (coll. Franc), issued as *M. attenuata* (det. Christ), is this species ; and so is Schlechter 15050 under the same name. *M. attenuata* is a distinct species.

OPHIOGLOSSACEÆ.

Ophioglossum pedunculosum Desv. Mt. Mou; shady grassy places (old cultivation terraces); cretaceous; 800 ft. Mt. Canala; Niaouli association; schists; 1500 ft. Ignambi; open moist turf; gneiss; 2000 ft. 594, 1132, 1614. Japan, Australia, New Zealand, tropical Asia.

The Ignambi plants, 1614, are much smaller than typical *O. pedunculosum*, but they come from the same locality as Schlechter's 15540, which matches my 594 and 1132; and it seems probable that they are merely a habitat form, as they differ in no other respect, as far as I can see.

O. pendulum Linn. Mt. Canala; moist forest; epiphytic; 1500 ft. Mt. Panié; high forest; epiphytic; 1500 ft. 1185, 1773. Tropical Asia, Australia, and Polynesia.

Helminthostachys zeylanica Hook. Mt. Mou; grassy places in shade (old native cultivation terraces); cretaceous; 800 ft. 559. Tropical Asia and Australia.

EQUISETALES.

EQUISETACEÆ.

Equisetum ramosissimum Desv. Mt. Mou; streamsides; cretaceous; 700 ft. Mt. Canala; in mud by stream; schists; 900 ft. 440, 1162. Tropics and sub-tropics.

The New Caledonian specimens are comparatively little branched; they have, however, the typical loose leaf-sheaths of *E. ramosissimum* as collected in Aneiteum (McGillivray 60) and Fiji (Seemann 697), and differ from the closely related *E. debile* Roxb. as collected in New Guinea (Kloss), which has tight sheaths.

LYCOPODIALES.

LYCOPODIACEÆ.

Lycopodium carinatum Desv. Ignambi; epiphytic in forest; 1500 ft. 1853. India, Malaya, Philippines, Formosa, Polynesia.

L. cernuum Linn. Mt. Mou; abundant in scrub; serpentine; 2500 ft. Mt. Koghi; abundant in *Melaleuca-Pteridium* association on dry hillsides above 1000 ft.; serpentine. Mt. Canala; etc. 576, 752. Tropics and sub-tropics.

L. densum Labill. Mt. Mou; scrub; serpentine; 2500 ft. and upwards. Nekando; among shrubs in forest margin; serpentine; 3000 ft. 630, 635, 2129. Australia, Tasmania, New Zealand, Norfolk Island.

This species is remarkable in showing a kind of *Retinospora* condition. In sheltered situations the leaves are erecto-patent; in open scrub they are closely appressed to the stem. Occasionally one can find shoots bearing both kinds of foliage. It is curious to note that the aspect of the erect shoots is that of a miniature Conifer.

Lycopodium ignambiense Compton, sp. nov. Sectionis *Selaginis* species nova. Planta epiphytica. *Caulis* pendens spatiis 4–8 cm. iterum atque iterum dichotoma viridis flexibilis tenuis gracilis 70 cm. long., basi diam. haud 1 mm. *Folia* subverticillata linearia, basalia divaricata, distalia erecto-patentia, 7–8 mm. long., basi 0·7 mm. lat., sursum sensim angustiora, costa media difficile adspectabilis, apex filiformis. Caulis partes sporangiferæ cum sterilibus alternantes. *Sporophylla* foliis similia, nisi basi paullo latiora, usque ad 1 mm. attingentia, sporangia vix occludentia.

Ignambi; on rocks and trees in high forest; 2500 ft. August. 1689.

A plant of very graceful habit, the weak flexible stems causing it to be completely pendulous. With some affinity to *L. verticillatum* Linn. fil., it most nearly resembles *L. sarmentosum* Spring, native in the north of S. America. It differs from that species in the green colour of the stem, the less prominent midribs of the leaves, and the fact that the sporophyll broadens slightly beneath the sporangium.

L. laterale R. Br. Mt. Mou; open scrub association; serpentine; 2000 ft. Australia and New Zealand.

L. mirabile Willd. Mt. Canala; on trunks in forest; 1500 ft. Mt. Arago; on trunks in forest; 1000 ft. Paompai; on rocks by stream; 200 ft. Tonine; epiphytic in forest; 2000 ft. 1190, 1424, 1875, 1962. Tropics of Old World, New Zealand.

Var. **microbracteata** Compton, var. nov. Varietas sporophyllis quam sporangia brevioribus, haud acutis.

Île Porc-Épic (East Coast); terrestrial in forest; serpentine; 100 ft. 956.

In the type of the species the sporophylls greatly exceed the sporangia in length, and are apiculate.

L. nutans Brack. Ignambi; on gneiss boulders in high forest; 1500 ft. 1678. Tahiti, Madagascar.

Forma **nana** Compton, form. nov. Ignambi; on trees in moist forest; 300 ft. 1504.

A puzzling starved form which I believe to be *L. nutans*, agreeing with that species in the shape of its leaves and sporophylls. Its total length is

13 cm., and stem and leaves are smaller than usual. My plant matches Schlechter's 15404 from the Oubatche Mts. (of which Ignambi is one) in Herb. Mus. Brit., sub nom. *L. carinatum*: from that species, however, it differs in the leaves, which are flat and not sharply keeled.

LYCOPODIUM PHYLLANTHUM Hook. & Arn. var. AURICULATUM Compton, var. nov. Folia late cordata subauriculata. Ignambi; on gneiss boulders near streams in high forest; 2000–3500 ft. 1508.

Differs from the type in the broadly cordate sessile leaves, almost auricled at the base. In Herb. Kew. there is a Samoan specimen (Whitmee 169) approaching this variety; but in all other material I have had an opportunity of examining the leaves are scarcely cordate at the base. The species occurs in India, Ceylon, Malaya, and Polynesia.

L. PHYLLANTHUM Hook. & Arn. forma NANA Compton, form. nov. Ignambi; on trees in moist forest; 3000 ft. 1506. A small exposed form of this species, I believe, with stems 1–2 mm. in diameter at the base, yellowish-green leaves 7–8 mm. × 3–4 mm., set edgewise; the sterile part of the stem 10 cm. long, the strobili 8–9 cm. long.

L. SCHLECHTERI E. Pritzel. Mt. Mou; on rock-ledge in slight shelter; serpentine scrub; 3500 ft. Nekando; rocks in slight shelter; serpentine scrub; 3000 ft. 634 *a*.

This species, first collected by Schlechter on the Ngoye Mts. (of which Nekando is one) at 1000 m. altitude (15174), may be merely an exposure form of *L. nutans* Brack., to which it bears a close resemblance. It differs in the erect simple stem and short recurved strobili. In the absence of good connecting-links, however, it is best to keep it provisionally as a distinct species.

L. SERRATUM Thunb. Ignambi; on ground in high forest; gneiss; 2000–3000 ft. 1497. Japan, China, India, Malaya, Polynesia, Mexico.

The shoots, which are terrestrial and sometimes attain a foot in height, are abundantly gemmiferous; the production of gemmæ seems to be the chief mode of propagation, and all stages in their germination were found.

L. SQUARROSUM Forst. var. PACIFICUM Compton, var. nov. Varietas strobilo a parte sterile plantæ haud dissimile.

Mt. Humboldt; on stones and trunks in moist forest; 1000 ft. Ignambi; on rocks and trunks in moist forest; 2000–3000 ft. 1026, 1026 *a*, 1500, 1502.

The New Caledonian plants agree with those from the Pacific Ocean in general in having the strobilus less sharply distinct from the sterile portion of the stem than is the case in the Indian and Malay plants. Other specimens belonging to this variety have been collected in New Caledonia (Vieillard 1687, Schlechter 15454), Normanby Island, Louisiade Archipelago (Mueller 127, coll. McGregor), Aneiteum, New Hebrides (McGillivray), Fiji (Seeman 704), Upolu (Graeffe), Samoa (Whitmee), Society Islands (Banks and Solander), Tahiti (Cook).

My specimens vary much according to conditions. 1502, which had a somewhat exposed position on a trunk at 3000 ft., is rather stiffly erect with dense yellowish foliage. 1026, which is of the most frequent form, grew in greater shelter at 1000 ft., and is more lax and drooping with less dense light green leaves. 1026 *a*, growing with 1026, is a starved crowded specimen of small stature, weak and drooping; and no. 1500 is a similar form.

LYCOPODIUM VARIUM R. Br. Mt. Koghi; on trunks in forest; 1500 ft. 794. Australia, Tasmania, New Zealand, and Auckland Island.

L. VOLUBILE Forst. Mt. Canala; forest margin; schists; 3000 ft. Ignambi; forest margin; gneiss; 3000 ft. 1220. New Zealand, Malaya, N. Australia, Polynesia.

The strobili are about an inch in length, this being rather shorter than is typical—New Zealand plants, for instance, bearing strobili up to 3 inches long.

SELAGINELLACEÆ.

SELAGINELLA HORDEIFORMIS Baker. Mt. Koghi; frequent in forest above 500 ft.; serpentine. 792. Fiji.

This handsome species has whitish stem-leaves and a dark green expanded frond. It frequently ascends the trunks of tree-ferns to a height of 4 or 5 feet by clasping with its rhizome and by inserting rhizophores among the host's leaf-bases.

S. JOUANI Hieron. Ermitage Stream; in forests near waterside; serpentine; 300 ft. Mt. Mou; high forest; serpentine; 1500 ft. 211, 438.

Differs from its close ally, *S. firmuloides* Warb. in its short strobili and the short points of its sporophylls.

S. MEGASTACHYA Baker. Mt. Arago; locally abundant in moist forest; schists; 1000 ft. 1412.

All the specimens I have seen agree in a feature in which they differ from Baker's original description—namely, the leaves of the upper plane are cuspidate. This applies to specimens determined as *S. megastachya* by Baker himself. The original description is therefore in error.

S. NEOCALEDONICA Baker, Mt. Mou; high forest; serpentine (shelter form); 2500 ft. Mt. Koghi: in stony *Pteridium* association; serpentine (exposed form); above 2000 ft. 566, 739.

There is some confusion between this species and *S. usta*, from which, however, it seems to be distinct. The stem is decumbent in shelter, erect in the open, branched from near the base. The leaves are more distant, smaller and narrower than in *S. usta*, and are not all cordate. The strobili are short, about 5 mm. long. In exposed situations (739) it has a reddish-brown colour like *S. usta*, but in shelter it remains green.

SELAGINELLA USTA Vieill. Plaine des Lacs; on the level flood-plain; uncommon; serpentine; 800 ft. 370.

This species differs from *S. neocaledonica* in the following respects. It is erect and not decumbent. The leaves of the lower plane are closer on the main stem, and are broader and almost cordate at the base. The stem is unbranched at the base. The strobili are distinctly longer, often exceeding 1 cm. The colour is reddish, as in the exposure forms of *S. neocaledonica*. Hieronymus (in Sarasin and Roux, Nova Cal. B. i. 64) doubts whether *S. usta* and *S. neocaledonica* are not habitat forms of the same species. But the true exposure form of *S. neocaledonica* is distinct from *S. usta*.

S. VIEILLARDII Warb. (ex descr.). Mt. Dore; prostrate on soil in open scrub; serpentine; 800 ft. 669.

PSILOTALES.

PSILOTACEÆ.

PSILOTUM TRIQUETRUM Sw. Canala; in hollows on tree-trunks; 50 ft. Paompai; on trunks in forest; 500 ft. 1332. Tropics, Japan, New Zealand.

TMESIPTERIS.—My collections of this genus have been examined anatomically by Mr. Birbal Sahni at the Cambridge Botany School; and it is his opinion (in which I concur) that it is impossible to reduce all the forms to a single species. Three of Dangeard's species—namely, *Tm. Vieillardii*, *Tm. lanceolata*, and *Tm. tannensis*—should certainly be kept up; the fourth, *Tm. truncata*, is of more doubtful validity, and we have therefore combined it, as represented by my 452, with *Tm. tannensis*, of which it appears to be a growth variant.

TMESIPTERIS LANCEOLATA Dang. Mt. Canala; on trunks of tree-ferns in forest; 1500 ft. 1192.

This species agrees with *Tm. tannensis*, and differs from *Tm. Vieillardii* in its epiphytic pendulous habit. It is specially distinguished by its acute leaves, not at all truncate but gradually tapering into a long acumen; the substance of the leaf is rather thick, almost coriaceous, and the leaf-margin is markedly thickened.

TMESIPTERIS TANNENSIS Bernh. Mt. Panié; on tree-ferns in forest. Tonine; on tree-ferns in forest; 2000 ft. 1823, 1967.

My specimens vary in details, breadth of leaves, &c., but should probably be grouped together. They agree in habitat, all being found on the trunks of tree-ferns or among the rhizomes of climbing ferns at moderate altitudes. The stems are pendulous, rarely branched, flexible, more slender than in *Tm. Vieillardii*; the leaves are not recurved and are broadest in the middle; their texture is thin and the margin is not thickened. Australia, Polynesia, New Zealand.

T. VIEILLARDII Dang. Mt. Mou; terrestrial in high forest; serpentine; 3500 ft. 610.

This plant is certainly distinct from *Tm. tannensis*. It grows on the ground, the rhizome being a few centimetres deep in forest humus, and is confined to altitudes of above 1000 m. The stem is tall, stiffly erect, and unbranched, stouter than in *Tm. tannensis*. The leaves are multifarious, rigid, falcately recurved, and have parallel margins. It seems to be peculiar to New Caledonia.

Rosenstock's *Fil. Nov. Cal.* exs. 152, labelled *Tm. Vieillardii*, is a form of *Tm. tannensis*. Schlechter's 14940 and 15295, sub nom. *Tm. tannensis*, are *Tm. Vieillardii*.

MUSCI.

Par I. THÉRIOT.

CAMPYLOPUS BALANSÆANUS Besch. Mt. Ngoye, 500–1000 m. 1007. Très abondant sur la terre, entre les rochers et les arbustes. Copieusement fructifié.

M. Fleischer (Musci Fl. Buitenzorg, 111) affirme, d'après un échantillon récolté par Dupuy aux environs de Nouméa, que *C. Balansæanus* Besch. est la même chose que *C. aureus* van den Bosch & Lac. Je ne partage pas cet avis; sans entrer dans le détail des différences, je me borne à signaler que dans la dernière espèce, la capsule est ovale et très régulière, alors que le *C. Balansæanus* a une capsule oblongue, toujours plus ou moins asymétrique.

SYNODONTIA FALCATA Broth. & Par. Mt. Koghi, 100 m.; sur troncs d'arbres dans les forêts. 743. Fructifiée.

S. CONNIVENS Broth. (*Dicnemon connivens* Besch.). Ignambi; sur les troncs d'arbres. 1595. Fructifiée.

S. CUSPIDATA Broth. (*Dicnemon cuspidatus* Besch.). Mt. Mou, 1200 m.; abondante sur les troncs dans les forêts du sommet. 613. Fructifiée.

On connaît aujourd'hui 9 espèces du genre *Synodontia*, toutes localisées en Nouvelle-Calédonie.

LEUCOBRYUM CONOCLADUM Besch. Mt. Mou, 1200 m.; dans les forêts, sur les racines des arbres. 637.

MACROMITRIUM LERATIOIDES Broth. & Par. Plaine des Lacs; sur les troncs, dans les hautes futaies. 274. Fructifié.

V. F. Brotherus compare cette espèce au *M. pacificum* Besch. Aux différences qu'il signale, il convient d'ajouter qu'ici la coiffe est nettement poilue, alors que *M. pacificum* a une coiffe nue.

Les véritables affinités de *M. leratioides* Broth. & Par. sont ailleurs: cette mousse est surtout alliée aux *M. Renauldi* Thér. et *M. gracilipes* Card. de Nouvelle-Calédonie. Les différences qui séparent ces trois espèces sont en somme assez légères, et je ne serais pas surpris si des recherches ultérieures conduisaient à les confondre en une seule et même espèce.

BRACHYMENIUM INDICUM van den Bosch. & Lac. var. CORRUGATUM Besch. Baie Ouémo; dans les bois près de la mer; abonde sur la terre. 133. Fructifié.

La variété croît en Nouvelle-Calédonie; le type à Java et Amboine.

BRYUM PANCHERI Jaeg. (*B. crassinervium* Besch.). Rivière Ngoyé, en touffes épaisses dans les fentes des rochers. 1024. Fructifié. Assez répandu.

RHIZOGONIUM NOVÆ-CALEDONIÆ Besch. Mt. Koghi, 350 m. 754. Mt. Canala, 300 m. 1141. Fructifié.

Le no. 1141 représente une forme à feuilles plus étroites et à nervure plus large.

POGONATUM CIRCINATUM Besch. Mt. Canala, très abondant sur le sol argilo-schisteux. 1164. Fructifié.

P. NEO-CALEDONICUM Besch. Mt. Canala, 800 m.; forêts; sur la terre nue, argileuse. 1140. Fructifié.

Ces deux espèces sont les seules du genre qui aient été trouvées en Nouvelle-Calédonie. La première y est assez commune; elle forme sur la terre des tapis étendus et assez compacts. La seconde semble, au contraire, vivre par brins isolés, disséminés parmi d'autres mousses, et quelquefois même au milieu des touffes de *P. circinatum*.

SPIRIDENS VIEILLARDI Schp. Mt. Canala. 1233. Ignambi. 1657. Abonde sur les troncs, et particulièrement sur les troncs de fougères arborescentes. Fructifie copieusement.

FRANCIELLA SPIRIDENTOIDES Thér., in Bull. Acad. Géog. bot. (1910) 100. Ignambi; forêt au-dessus de 500 m; sur les troncs des arbres. 1656. Fructifiée.

Cette espèce, une des plus belles de la flore bryologique néo-calédonienne, a été découverte par mon correspondant et ami I. Franc, en 1910, dans les forêts du Mt. Panié, au nord de l'île. Ignambi est la deuxième localité connue.

PTYCHOMNION ACICULARE Mitt. Mt. Koghi, 1000 m.; sur troncs d'arbres morts, dans la forêt. 742.

Espèce répandue dans les îles du Pacifique et dans les terres du sud de l'Amérique méridionale.

FLORIBUNDARIA FLORIBUNDA Fleisch. var. BREVIFOLIA Ren. & Card. Paompai; abonde dans les forêts humides. 1916. En beaux fruits.

Cette variété n'était connue jusqu'ici qu'en Asie dans l'Himalaya. Le type a une aire d'expansion très étendue; il existe en Afrique, à Madagascar, dans le sud de l'Asie, au Japon, dans les îles de la Sonde et du Pacifique.

D'après Fleischer, les feuilles caulinaires de *F. floribunda*, sont dressées et appliquées sur la tige. Cependant j'ai constaté que dans la plante de Paompai, les feuilles caulinaires sont toujours étalées; cette disposition des feuilles se vérifie également sur la plante de l'Himalaya (comm. Cardot).

NECKEROPSIS LEPINEANA Fleisch. (*Neckera Lepineana* Mont.) forma GIGANTEA Fleisch. Mt. Mou; sur les vieux troncs, dans les forêts humides; 700 m. 449. Philippines, Célèbes, Java, Sumatra, etc.; îles du Pacifique; et aussi suivant Fleischer en Afrique, dans l'Usambara, à Madagascar et dans les îles voisines.

CALLICOSTELLA PAPILLATA Jaeg. (*Hookeria papillata* Mont.). Mt. Koghi; sur l'écorce d'arbres et sur les rochers près d'un ruisseau. 801 *b*. Bengale, îles de la Sonde, îles du Pacifique. Elle semble assez commune en Nouvelle-Calédonie.

C. PRABAKTIANA Dozy & Molk., Bryol. jav., forma. Ermitage; sur l'écorce d'arbres morts, au-dessus d'un ruisseau. 158 *a*. Fructifiée.

Les feuilles de cette plante ont un tissu presque hyalin, plus lâche que dans les formes habituelles de l'espèce. Je la rapporte néanmoins au *C. prabaktiana* à cause de son pédicelle court (5–6 mm.) et du tissu foliaire lisse.

Je la crois nouvelle pour l'île. Il est vrai qu'elle est citée dans les listes de doubles du général Paris; mais comme V. F. Brotherus n'en fait pas mention dans ses *Contributions à la flore de Nouvelle-Calédonie*, je suis fondé à croire qu'elle figure par erreur dans les listes du gén. Paris, à l'exemple d'un certain nombre d'autres.

Borneo, Java.

RHACOPILUM SPECTABILE Reinw. & Hornsch. Mt. Mou, alt. 600 m.; forêts, sur les troncs d'arbres. 590. Fructifié.

Îles de la Sonde et Pacifique.

THUIDIUM NUTANS Besch. Ermitage; abondant sur les arbres, les cailloux, mais rarement fructifié. 183.

ECTROPOTHECIUM DISTICHELLUM Kindb. Enum. M. exot. p. 98 (*Hypnum distichellum* C. M.). Mt. Mou, alt. 350 m.; sur l'écorce des vieux troncs. 476, 477. Fructifié.

—— ——, forma. Même localité. 598. Forme à rameaux moins comprimés, à feuilles plus fortement falciformes. Espèce polymorphe.

VESICULARIA APERTA Thériot (*Hypnum apertum* Sull.). Mt. Mou, 700 m.; sur les vieux troncs, dans les forêts humides. 449. Hawaï.

J'ai nommé cette plante de Nouvelle-Calédonie *V. aperta*, à cause de ses feuilles très brièvement acuminées et de ses cellules foliaires à parois épaissies; cependant ces cellules paraissent un peu plus longues que dans le type, à en juger par les figures de Sullivant; elles sont d'autre part bourrées de grains chlorophylleux, de manière à rendre le tissu presque opaque, ce que l'on voit rarement dans le genre *Vesicularia*.

Le *V. aperta* constitue avec les *V. bryifolia* (C. Muell.) et *V. inflectens* (Brid.) un petit groupe d'espèces très affines et parfois difficiles à distinguer l'une de l'autre. Elles semblent ne différer entre elles que par la longueur des feuilles, la forme et la longueur de l'acumen, l'allongement des cellules. On sait combien ces caractères sont sujets à varier: on trouvera, par exemple, des plantes qui auront, comme dans la forme ci-dessus, les feuilles de *V. aperta* et le tissu de *V. inflectens*, ou inversement.

Il sera sage peut-être, après un examen approfondi des types, d'opérer des réductions dans ce groupe, comme aussi d'ailleurs dans d'autres groupes de ce même genre.

V. SUBCALODICTYON Broth. & Par., in Broth. Contrib. fl. bryol. Nouv.-Caléd. iii. 37 (1911), forma. Ermitage; sur l'écorce des arbres morts, au dessus d'un ruisseau. 158, 158*a*. Fructifié.

Cette plante n'est pas absolument identique au type de l'île des Pins: elle en diffère par l'acumen des feuilles moins long et moins fin, la présence d'une double nervure bien marquée; mais elle a même taille et même port, même forme et mêmes dimensions des feuilles, même tissu foliaire. L'ensemble de ces caractères communs suffit, je crois, à justifier mon opinion. On ne pourrait songer d'ailleurs à la rapporter au *V. calodictyon* (C. M.) qui, d'après Brotherus, est deux fois moins robuste que *V. subcalodictyon*.

WARBURGIELLA CUPRESSINOIDES C. Muell. ex Broth. Mt. Koghi, 1000 m.; dans les bois, sur les troncs d'arbres tombés. 745. Fructifiée. Îles Philippines; Mindanao.

SCIADOCLADUS SPLENDIDUS Jaeg. (*Hypnodendron splendidum* Besch.). Ignambi, 1000 m.; sur la terre, abonde dans les forêts humides. 1596. Fructifié.

On the Leaf-tips of certain Monocotyledons.

By AGNES ARBER, D.Sc., F.L.S., Keddey Fletcher-Warr Student of the University of London.

(With 14 Text-figures.)

[Read 3rd February, 1921.]

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INTRODUCTION.

IT has long been known that a number of dorsiventral leaves among Monocotyledons are slightly hooded at the tip of the limb, and terminate in a solid cylindrical apex, sometimes of considerable length, but sometimes so short as to escape general attention. The question of the *biological* value of the leaf-apices of Monocotyledons has been considered by various authors in connection with "drip-tips" * and with the extrusion of water †, while Goebel ‡, who has made a special study of certain of those cylindrical apices with which we are here more particularly concerned, regards them as organs serving for bud-closure ("plug-tips") and also for respiration. But although in their teleological aspect these structures have received so much notice, their *morphological* interpretation seems never to have come under discussion. In a recent paper §, as a result of studying the leaves of certain Liliaceæ from the standpoint of the Phyllode Theory, I have suggested that, in *Tulipa sylvestris* and one or two similar cases, the main part of the leaf is of leaf-sheath nature, while the solid apex is to be regarded as a vestigial petiole—the lamina being altogether unrepresented. The interpretation was based upon a comparison with the bud-scales of the Dicotyledon, *Fatsia japonica*, Decne. & Planch. In this plant, among the transitional leaf-forms between the bud-scales, which are of leaf-base nature, and the mature foliage-leaves, we find sheathing leaves terminating in a solid cylindrical apex, corresponding to the basal part of the petiole in the fully-developed leaf *. In its form and anatomy, and in its relation to the leaf-sheath, this apex exactly recalls that of *Tulipa sylvestris*, etc. In the present paper, a more extended study of leaf-apices is undertaken, in order to determine whether the explanation advanced for *Tulipa sylvestris* is capable of general application to Monocotyledonous leaves with cylindrical tips.

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* Jungner, J. R. (1891), Stahl, E. (1893).

† Volkens, G. (1883), Minden, M. von (1899), etc.

‡ Goebel, K. (1901) and (1905).

§ Arber, A. (1920^1).

Monocotyledonous leaves with solid apices fall into three categories:—simple foliage-leaves with no differentiated limb; spathe-leaves; foliage-leaves with "pseudo-laminæ." We will consider these in order.

1. *Foliage-leaves of the Type of* Tulipa sylvestris, *L.*

Leaves of the type of *Tulipa sylvestris* have a sheathing parallel-veined limb, terminating in a cylindrical apex. The Wild Tulip is not an isolated case, for such leaves occur in a number of the Liliifloræ. In this Cohort we can trace every gradation from leaves which—on my interpretation—are petiolar phyllodes in which the sheathing base is relatively unimportant, to leaves which are mainly of leaf-sheath nature, but terminate in the tiniest rudiment of a vestigial petiole. It is the latter type of leaf which specially concerns us here. In the Liliaceæ I have already recorded the existence of a solid cylindrical tip in the genera *Hyacinthus* and *Scilla* †, while *Dracæna* ‡ (figs. 2–4) and *Cordyline* afford other examples. *Aletris* ‡ (fig. 7) in the Hæmodoraceæ, *Doryanthes* § (fig. 1) and *Furcræa* in the Amaryllidaceæ, *Moræa* ‖ in the Iridaceæ, and *Distichia* (fig. 6) in the Junceaceæ, supply comparable cases. This type of leaf is, however, by no means confined to the Liliifloræ; among the Farinosæ it forms a conspicuous feature. Leaves resembling those of *Distichia* occur, for instance, in *Elegia* (fig. 5), *Restio*, *Lepyrodia*, *Leptocarpus* (Restiaceæ), and are found, though less typically developed, in certain species of *Bromelia* (fig. 8), and *Tillandsia* (fig. 9) (Bromeliaceæ).

The anatomy of these solid apices supports the petiolar interpretation. Goebel ¶ has described the occurrence of a bundle-ring in the leaf-tip of *Doryanthes Palmeri*, W. Hill, and I have found the same structure in *D. Guilfoylei*, W. M. Bailey. The solid apex in this species is developed on a very conspicuous scale (fig. 1); in the plants grown at Kew it may be more than 0·5 cm. in diameter. In the apex of *Dracæna Draco*, L.

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* Arber, A. (1920^1), figs. 1 A, B, C, p. 339.

† Arber, A. (1920^1).

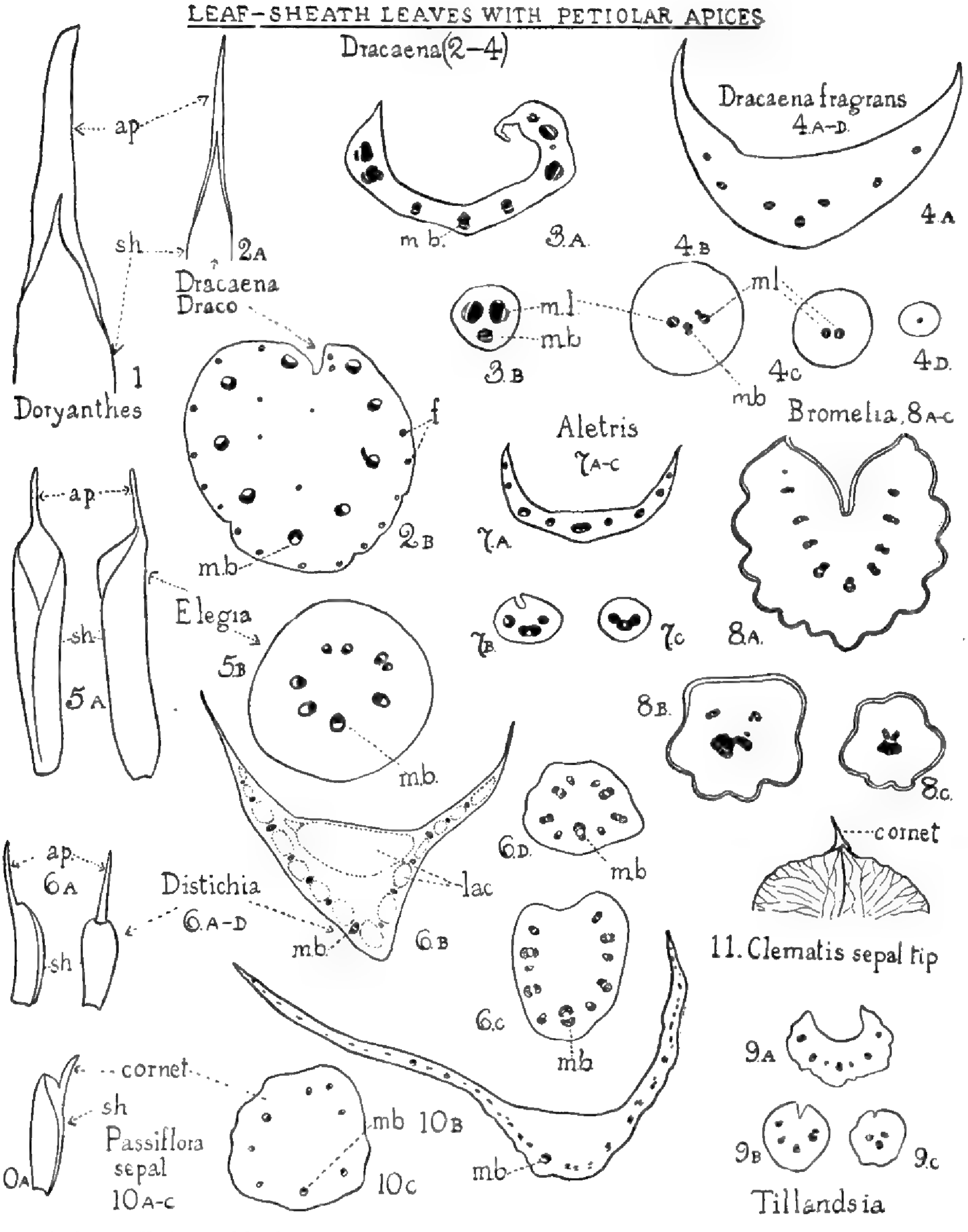
‡ Velenovský, J. (1907).

§ Goebel, K. (1901).

‖ Ross, H. (1892-3), Arber, A. (1921).

¶ Goebel, K. (1901).

Figs. 1-11.


LEAF-SHEATH LEAVES WITH PETIOLAR APICES
Dracaena (2-4)
ap
sh
2A
1
Doryanthes
Dracaena Draco
m b
3A
Dracaena fragrans 4A-D
4A
4B
m.l
m.b
3B
ml
mb
4c
4D
f
2B
m.b
Aletris 7A-C
7A
Bromelia, 8A-C
7B
7c
8A
ap
sh
Elegia
5B
5A
m.b.
8B
8c
cornet
6D
mb
ap
6A
Distichia 6A-D
lac
mb
6B
sh
11. Clematis sepal tip
6c
mb
9A
cornet
sh
Passiflora sepal 10A-C
10A
mb 10B
10c
mb
9B
9c
Tillandsia

Figs. 1-11. (Xylem, black; phloem, white; fibres, dotted; *m.b.*=median bundle; *m.l.*=main lateral bundle; *lac.*=lacuna; *sh.*=leaf-sheath region; *ap.*=petiolar apex.)—Fig. 1. Tip of leaf of *Doryanthes Guilfoylei*, W. M. Bailey (nat. size). Fig. 2. *Dracæna Draco*; 2 A, tip of leaf (nat. size); 2 B, trans. sect. at base of apex (×14); *f*=strands of fibres. Fig. 3. *Dracæna* "Duchess of York"; 3 A, trans. sect. leaf near tip; 3 B, trans. sect. solid apex to show importance of main laterals (×14). Fig. 4. *Dracæna fragrans*, Ker-Gawl., series of trans. sect. through tip of leaf (×14); fig. 4 D is from a second leaf. Fig. 5. *Elegia deusta*, Kunth; 5 A, two views of leaf (nat. size); 5 B, trans. sect. apex (×23). Fig. 6. *Distichia clandestina*, Buchen.; 6 A, two views of leaf (nat. size); 6 B–D, series of trans. sect. through upper part of leaf (×23); in the herbarium material used, xylem and phloem were not distinguishable. Fig. 7. *Aletris farinosa*, L., series of trans. sections through tip of leaf (×14). Fig. 8. *Bromelia* "*macrodonta*" (=? *Ananas macrodontes*, E. Morren), series of trans. sect. through tip of leaf (×14), margin fibrous. Fig. 9. *Tillandsia Lescaillei*, Wright, series of trans. sect. through leaf-tip (×14). Fig. 10. *Passiflora incarnata*, L.; 10 A, sepal (nat. size); 10 B, trans. sect. sheath region (×14); the asymmetry is natural; the bundles are nearly all cut obliquely; 10 C, trans. sect. of "cornet" (×23), *m.b.*=? median bundle. Fig. 11. *Clematis* sp., apex of sepal from ventral side to show "cornet" (nat. size).

(figs. 2 A & B), *Distichia clandestina*, Buchen. (figs. 6 A–D) and *Elegia deusta* Kunth (figs. 5, A & B), I have also found a closed ring of bundles. In the leaf of the *Dracæna* cultivated under the name "Duchess of York" (figs. 3 A & B), the main lateral bundles (*m.l.*) were observed to become, towards the apex, more conspicuous than the midrib (*m.b.*). In two leaves of *Dracæna fragrans*, Ker-Gawl. (figs. 4 A–D), which I examined, this process was carried so far that the main bundle disappeared by fusion with one of the laterals, with the result that, towards the extremity of the leaf-tip, the vascular system consisted of a pair of bundles (fig. 4 C), which ultimately fused (fig. 4 D). The subsidiary part played by the midrib in such cases may possibly, as I have previously suggested in connection with some other members of the Liliaceæ *, be an indication of phyllodic origin, but this is a point on which little stress can be laid.

In the apex of a species of *Bromelia*, again, I have found a petiole-like vascular scheme, with inverted bundles towards the adaxial surface (figs. 8 A–C), but in *Tillandsia Lescaillei*, Wright (figs. 9 A–C), and in *Aletris farinosa*, L. (figs. 7 A–C), the anatomy of the tip departs less from that of the limb.

Lonay † has described a ring of bundles in the "acumen" terminating the leaf of *Ornithogalum caudatum*, Ait.

If the explanation previously advanced ‡ for the leaf-tip of *Tulipa* be accepted, there seems no reason why it should not be applied to the further cases which we have been considering in the present section of this paper. It is, however, possible to hold the view that we are dealing with vestigial petioles in the case of those better-developed apices which reveal an almost radial type of vascular symmetry (e.g., *Doryanthes*, *Distichia*, and *Elegia*), while reserving judgment in the case of the relatively inconspicuous leaf-tips of *Aletris*, *Tillandsia*, etc., which, instead of being reduced petioles, may represent a secondary modification.

Velenovský §, who draws attention to a number of plants whose leaves have solid apices, points out that this form of tip is frequent in Monocotyledons, but very rare in Dicotyledons, and is characteristically associated with a simple type of leaf—undifferentiated into sheath and limb, and without a ligule. He offers no explanation of these facts, which, however, become readily intelligible from the standpoint adopted in the present paper; if the leaves in question are merely highly-developed leaf-bases terminated by abortive petioles, it is obviously useless to look for them among the laminated leaves of Dicotyledons, while, in the Monocotyledonous cases, the ligule, if appearing at all, would be located immediately below the solid leaf-apex.

* Arber, A. (1920^3), pp. 461–2.

† Lonay, H. (1902).

‡ Arber, A. (1920^1).

§ Velenovský, J. (1907).

Our present interpretation of the solid apices of Monocotyledonous leaves, as being vestigial petioles, does not appear to have been proposed by any previous writer, but I have lately learned that Hallier *, in a discussion of the nature of the parts of the Angiospermic flower, has put forward a view which is very suggestive in this connection. He draws attention to the fact that certain Dicotyledonous sepals terminate in a point which he calls a "cornet" or "aiguilla." He treats the case of *Hymenogyne glabra*, Haw. (Aizoaceæ) in special detail, and points out that, on comparing the outer sepals of this plant with the foliage-leaves—which towards the base are gradually reduced to long membranous sheaths—one recognises at once that the winged region of these sepals corresponds to a leaf-sheath and the point to an aborted petiole. He considers that the same explanation applies to such structures as the awned glumes of the Gramineæ. Hallier draws the general conclusion that the sepal of the Angiosperm is the sheath of a bract, which in some rare cases has preserved the remains of the petiole in the form of a "cornet." To the cases cited by Hallier, we may add that of *Clematis*, certain garden forms of which show a conspicuous "aiguilla," which is, however, small in comparison with the sepal as a whole (fig. 11).

I have examined the sepals of *Passiflora incarnata*, L., a member of one of the genera mentioned by Hallier, and I have found that not only in the external form, but also in the anatomical structure, there is a close resemblance between these floral leaves and the foliage-leaves of such plants as *Elegia* and *Distichia* (*cf.* figs. 10 A–C with figs. 5 A and B, and figs. 6 A–D). In both cases there is a more or less complete ring of bundles in the apical point. If Hallier's interpretation be accepted for the sepals of *Passiflora*, credence can scarcely, in consistency, be refused to the interpretation of the foliage-leaves of *Elegia* and *Distichia* proposed in the present paper.

2. *Spathe-leaves of the Type of* Ludovia crenifolia, *Drude*.

Certain spathe-leaves associated with the inflorescence in the Palms, Aroids, and Cyclanthaceæ, appear to have a solid cylindrical apex, comparable to that of the foliage and floral leaves considered in the preceding section of this paper. I do not propose to deal with these spathes in detail now, as I think it will be more satisfactory to treat them, later, in connection with the leaf-morphology of the Families to which they belong; but one case from the Cyclanthaceæ may be described as an example.

The inflorescences of the Cyclanthaceæ are enclosed in 2–6 boat-shaped spathes. I have been able to examine three such spathe-leaves from an inflorescence of *Ludovia crenifolia*, Drude; they differed in detail, but agreed in possessing a solid cylindrical apex. Fig. 12 A shows the dorsiventral structure a short way below the tip; still lower the sheath opens out, and there is a row of gum-canals in the place of the two (g) seen in this sketch. A little higher, on the other hand, the sheath closes into a solid, more or less cylindrical body (figs. 12 B & C). A curious feature is the occurrence of the small structure which I have marked *l.*, and which I think may possibly be interpreted as a ligule, but this cannot be decided without further material. This special point, to which I want to draw attention here, is the *petiolar* character of the anatomy of this apex, which is particularly obvious in fig. 13, drawn from a second spathe. The arrangement of the bundles recalls that met with in certain *Acacia* phyllodes, whose petiolar nature is generally accepted, as well as in various "equitant" leaves which I have previously interpreted as phyllodic *.

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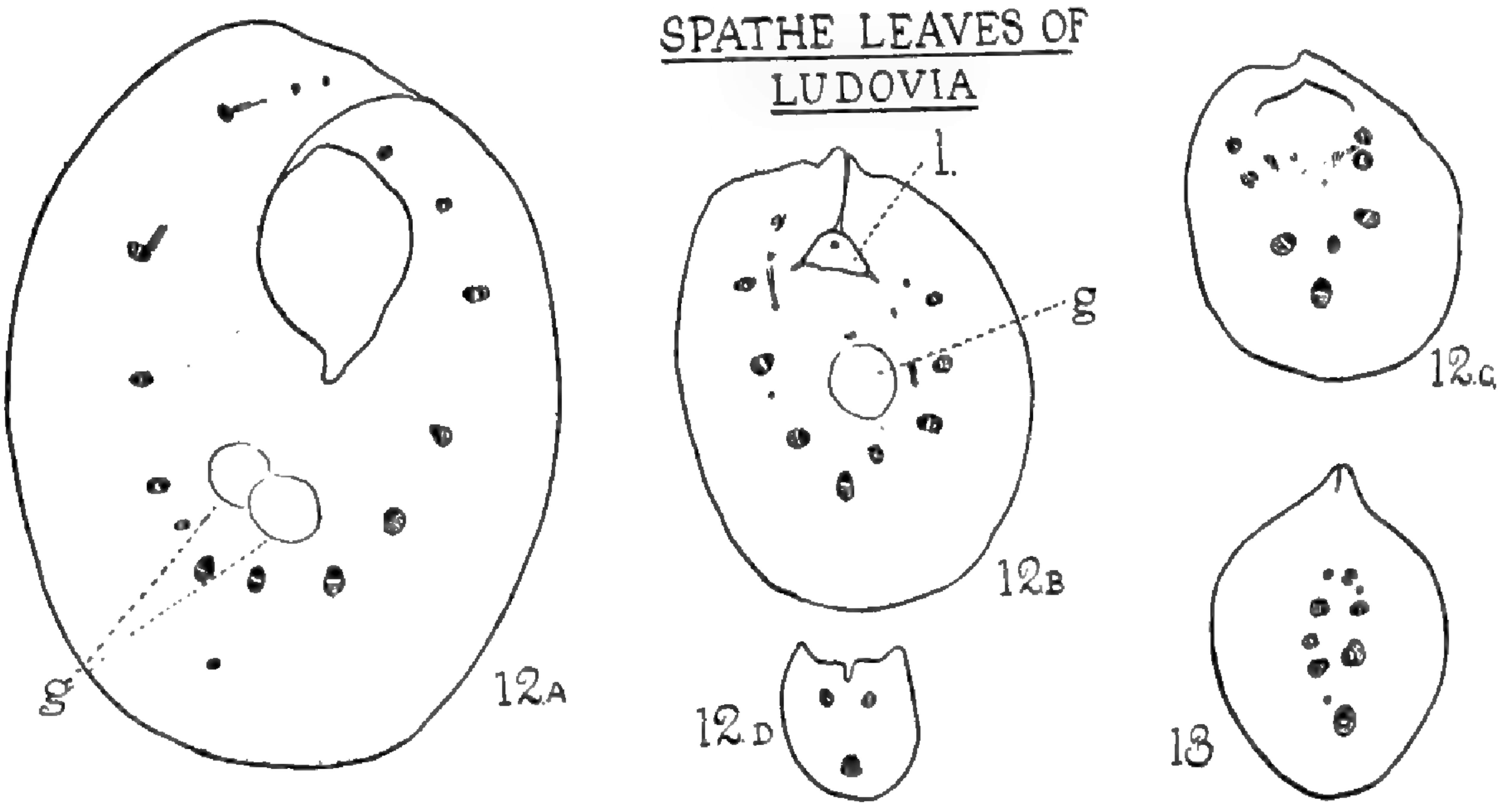
* Hallier, H. (1912), pp. 191–2.

FIGS. 12–13.



FIGS. 12 & 13. *Ludovia crenifolia*, Dr.; transverse sections through apical region of spathe-leaves (×14).—Fig. 12 A-D, series from one spathe. Fig. 13. Section from tip of another spathe; g=gum-canals; *l.*=? ligule.

3. *Pseudo-laminæ of the Type of* Smilax aspera, *L.*

A number of Monocotyledonous leaves are differentiated into a sheath, stalk, and distinct blade. I have given reasons elsewhere † for regarding this blade as a mere flattening or expansion of the distal region of the petiole, and have proposed for it the name, "pseudo-lamina," to distinguish it from the true lamina of the Dicotyledon. In certain cases the limb of such a leaf terminates in a solid apex, resembling those of the simpler leaves we have been considering. Such an apex is specially characteristic of the Musaceæ, but it occurs also in other Families (*e.g.*, species of *Calla*, *Anthurium*, *Dieffenbachia*, and *Philodendron* of the Araceæ, and *Smilax aspera*, L., of the Liliaceæ).

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* Arber, A. (1918), pp. 482–6.

† Arber, A. (1918).

In the case of *Smilax*, I have already suggested * that the thickened tip of the limb may represent the last relic of the unexpanded petiolar apex—that is to say, the expansion that formed the pseudo-lamina, though it involved the distal region of the petiole, did not extend to the extreme tip. In this connection it is interesting to notice that there is some evidence that *Smilax aspera* is one of the oldest members of the genus. The points in favour of this view are that it belongs to the largest Section—*Eusmilax*, DC.; that it is one of the four most widely-ranging members of this Section, which are also the four most widely-distributed forms among the 186 species making up the genus as a whole † ; and that it occurs in a large number of varieties. *S. aspera* is thus one of the species of *Smilax* in which it would, *a priori*, be least surprising to find some trace of the petiolar origin of the pseudo-lamina.

FIG. 14.

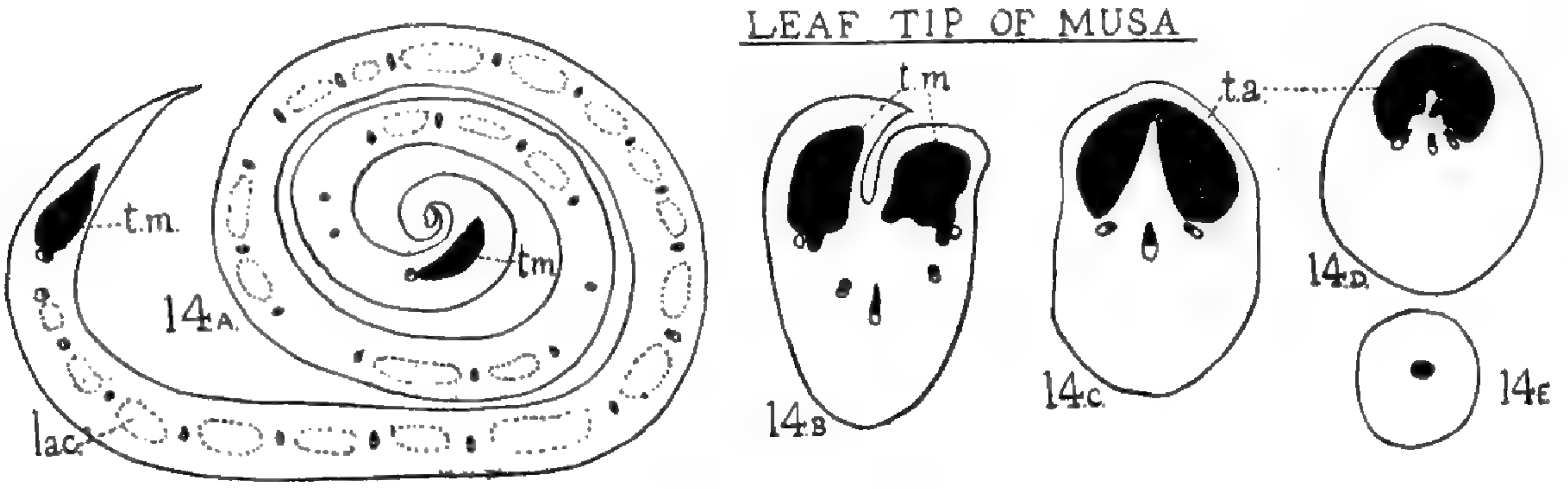

FIG. 14.—*Musa Basjoo*, Sieb. Series of transverse sections through tip of one foliage-leaf (×23). 14 A, section of limb a little below solid apex; the limb is rolled in the bud in a counter-clockwise direction, but as this series is taken upwards from below, the direction appears reversed; *t.m.*=tracheal mass; *lac.*=lacuna; 14 B, section at transition to solid apex; 14 C & D show fusion of tracheal masses to an arc, *t.a.* In 14 E the vascular system is reduced to a small group of elements, which seem to be chiefly tracheids.

The case of the Musaceæ is particularly striking. The young leaves are rolled in the bud, and are usually characterised by an ephemeral elongated apex, approximately cylindrical in form, which shrivels at an early stage. Material of very young leaves of *Musa* can, naturally, only be obtained in small quantities in this country, but I have been able to examine one young leaf of *Musa Basjoo*, Sieb., with the apex intact, and two slightly older leaf-tips of *Musa Cavendishii*, Lamb. The structure of the apex seems essentially identical in both species. In *Musa Basjoo*, the main part of the limb is flat and dorsiventral, but rolled in a counter-clockwise fashion in the bud. There is a single row of normally orientated bundles, but the marginal strands are highly peculiar; they each consist of a mass of tracheids, many of which are of unusual diameter, extending laterally outwards from the bundle nearest to the leaf-edge (*t.m.* in fig. 14 A). The transition to the more or less cylindrical apex is shown in fig. 14 B.

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* Arber, A. (1920^2), p. 440; the *S. mauretanica* of this paper is better regarded as a variety of *S. aspera*.

† Candolle, A. de (1878), p. 29.

In fig. 14 C the fusion of the two lateral vascular masses has produced an arc of tracheids facing the midrib (*t.a.*); the ground-plan of the vascular system at this stage thus approaches that of a petiole rather than a lamina, and I think we are justified in regarding the cylindrical tip as being, just as in the case of *Smilax*, the relic of an unexpanded petiolar apex. The superficial cells secrete mucilage, and it may be that the survival of the solid tip is to be associated with its value in the economy of the bud. It is interesting to find that the Musaceæ, besides being the members of the Scitamineæ in which the limb is normally characterised by the solid apex, which we have just described, are also the Family in which the floral specialisation has remained at a lower level than in the rest of the Cohort. I believe that there is a connection between these two facts, and that the survival of the solid leaf-apex—being a vestigial feature—is naturally associated with other primitive characters.

It is known that the solid leaf-apex of *Calla palustris* serves as a hydathode *, but this fact does not disprove the petiolar view of its morphology; it may be that the vestigial petiole apex has been retained because it has assumed the secondary hydathode function. It will be recalled that both *Calla* and *Anthurium*, with their hermaphrodite flowers, are members of the less specialised tribes among the Araceæ—that is to say, they belong to that part of the Family in which traces of the phyllodic origin of the leaf might reasonably be looked for. But the fact that the solid leaf spaces are also to be found in *Dieffenbachia* and *Philodendron* shows that in the Araceæ this structural peculiarity is by no means confined to members of the more generalised tribes. It is possibly, however, more than a mere coincidence that, both in *Smilax*, the Musaceæ, and certain Aroids, a pseudo-lamina with a solid tip is associated with other characters which indicate that the plants in question are relatively primitive members of their respective cycles of affinity.

There are considerable differences in the morphology of the pseudo-lamina in different families of Monocotyledons, and it would perhaps be rash to generalise about the interpretation of the apex of such a blade in the cases in which it takes a cylindrical form. Though some of these apices may, as I have suggested, represent vestigial petiolar tips, in others the thickening may possibly be a secondary development; each example must be judged on its own merits.

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* Volkens, G. (1883).

SUMMARY.

In the present paper the leaves of Monocotyledons are treated from the standpoint of the Phyllode Theory—that is to say, it is assumed that these leaves include no region equivalent, morphologically, to the lamina of the Dicotyledon.

It is concluded on the evidence of comparative morphology and anatomy that, in the case of simple Monocotyledonous foliage-leaves terminating in a solid apex, and also in the case of spathe-leaves ending in a similar tip, the main part of the leaf is of leaf-sheath nature, while the apex represents a vestigial petiole.

In the case of those more complex Monocotyledonous leaves which are differentiated into sheath, stalk, and "blade," certain cases are known in which the "blade" terminates in a solid apex. It is provisionally suggested that such apices represent the unexpanded tip of the petiole: in other words, the main part of the distal region of the leaf-stalk has developed into the "pseudo-lamina," while the extreme tip has remained relatively unmodified, retaining its solid petiolar character.

ACKNOWLEDGEMENTS.

I am indebted for material to the Director and to the Keeper of the Herbarium, the Royal Botanic Gardens, Kew; to the Superintendent of the Cambridge Botanic Garden; and to the Assistant Curator of the Liverpool Botanic Gardens. I wish also to express my gratitude to Mr. L. A. Boodle, who pointed out to me, some years ago, that the apical structure of Monocotyledonous leaves was one of the subjects demanding consideration in connexion with the Phyllode Theory of the Monocotyledonous leaf.

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The Mosses of the Wollaston Expedition to Dutch New Guinea, 1912–13; with some additional Mosses from British New Guinea. By H. N. Dixon, M.A., F.L.S.

(Plates 28, 29.)

[Read 4th November, 1920.]

It was intended to publish the Mosses of the Wollaston Expedition in the general Botanical Report (Trans. Linn. Soc. ser. 2, Bot. vol. ix. pt. 1, 1916), but Mr. C. H. Wright, to whom they were entrusted, was unable to work them out in time for that publication, and they were subsequently placed in my hands for determination. Though the collection was not a large one, consisting of some sixty gatherings, it proved to be highly interesting, including types of two new genera and more than a dozen new species.

I have added to the above an account of a further collection made by the Rev. J. B. Clark, of the London Missionary Society, on an expedition to Mt. Durigolo, an outlier of the Owen Stanley Range, in the neighbourhood of Boku, in the Port Moresby District, in 1916, which also contained several novelties, including a new species of *Pterobryella*, and a very remarkable minute species, probably of *Rhizogonium*, but of somewhat doubtful affinity.

The moss-flora of New Guinea affords, perhaps, the most interesting field for the present-day bryologist. Large tracts of Central Africa remain no doubt comparatively unexplored, and recent discoveries there show that much is still to be expected of bryological interest (*Leptodontiopsis*, Broth., *Kleioweisiopsis*, Dixon, new genera, may be mentioned, and new species of *Cyathophorum*, *Rutenbergia*, and *Micropoma*). But the flora is more distinctly continental and continuous, and the novelties are as a rule less distinct from known species, and less striking. Everyone who has done much systematic botanical work realizes that the description of a number of new species of the larger genera, while a necessary and to some extent a valuable part of taxonomic botany, is an uninteresting and very unexciting occupation, compared with the elucidation of new forms, however few, only distantly connected with known genera or species. For it is these which raise new problems, or help to solve old ones, in vegetable taxonomy. It is the monotypic (or small) genera, with a very local or restricted distribution, and often with only very distant or very doubtful affinity with known plants, which always rejoice the heart, while they often perplex the mind, of the systematist.

The working out of new genera and species—filling up, as they do, gaps in the vegetable taxonomy—may be compared with the putting together of a complex puzzle consisting of innumerable pieces. The description of numerous new species of the larger genera is like the filling up of the final gaps, once the general scheme of the puzzle is known; it is not exciting, though it brings some satisfaction in the rounding off and completion of the whole scheme. But it is the discovery of the monotypic or endemic forms, lacking apparent relationship with others, or revealing new and unexpected affinities, which answer to the key-pieces of the puzzle, by which the general scheme is for the first time revealed, or two isolated parts are unexpectedly brought into relationship with one another.

Such disconnected, endemic, or restricted types occur frequently in insular floras, but such floras are as a rule very limited, and the endemic types will often lie under the suspicion of being comparatively newly differentiated forms. The floras of the highest interest therefore naturally occur in those larger islands which by their isolation partake of an insular character, while of sufficiently large and varied extent to afford a rich flora; the three islands of Madagascar, New Zealand, and New Guinea fulfilling these conditions to an extent unequalled and scarcely approached by any other geographical regions of the world; their moss-floras, like the other branches of their fauna and flora, being correspondingly interesting and distinct. Of the three, that of New Guinea manifests perhaps the highest interest. One has only to mention, by way of illustration, such genera as *Braunfelsia* [5] *, *Schistomitrium* [6], *Spiridens* [6], *Mastopoma* [3], *Pelekium* [3], *Racelopus* [1], *Mniomalia* [4], *Bescherellea* [2], *Pterobryella* [5], *Symphysodon* [7], *Werneriobryum* [1], *Brotherobryum* [1], among New Guinea genera, to indicate the extent to which this "discontinuous" type of moss-flora prevails in that island, while in addition certain genera of rather larger size, but of strikingly restricted distribution, find their highest development here, notably *Dawsonia*, *Endotrichella*, *Chætomitrium*. To these are now to be added the two new genera described in this paper, which will be discussed more fully in their place.

The types of the new forms described here are at the British Museum unless otherwise noted. Duplicate types are in my herbarium.

MOSSES OF THE WOLLASTON EXPEDITION, COLLECTED BY C. B. KLOSS, ON MT. CARSTENSZ, DUTCH NEW GUINEA, 1912–13.

The itinerary and topographical notes have been given fully in the Report cited above (Trans. Bot. vol. ix. pt. 1), from which particulars of the various camps may be obtained. The figures in parentheses are my own numbering, made for purposes of reference.

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* The figures in brackets give the total number of species known in each genus.

DICRANACEÆ.

Dicranoloma Blumii (Nees), Par. Ind., Ed. II. ii. 24.
Camp VI *b*, 3900 ft. (Nos. 15, 15 *a*), c. fr.

Dicranoloma Armitii (C. Muell.), Par. Ind., Ed. II. ii. 24.
Camp VI *b*, 3900 ft. (No. 27), c. fr.

Thysanomitrium Lorentzii, Fleisch. in Nova Guinea, xii. 113. (*Pilopogon Lorentzii*, Fleisch. in Hedwig. l. (1911) 280.)
Camp VI *c*, 5500 ft. (No. 13), c. fr.

A fine species, differing from *T. exasperatum* (Nees), which also occurs in New Guinea, in having the leaves pointed and ending in a short hair-point, as well as in having the nerve smooth at back and the calyptra fringed at base.

Thysanomitrium Blumii, Dixon, comb. nov. (*Trichostomum Blumii*, Dozy & Molk. in Ann. Sc. Nat., Bot. Sér. 3me, ii. (1844) 316).
Camps VIII to IX, 4900–5500 ft. (No. 12). Camps IX to X, 5500–6700 ft. (No. 11), c. flor. ♂.

LEUCOBRYACEÆ.

Leucobryum javense, Mitt. Musc. Ind. Or. 25.
Camp VI *b*, 3900 ft. (No. 16).

FUNARIACEÆ.

Funaria hygrometrica (L.), Sibth. Fl. Oxon. 288.
Camp VI *c*, 5500 ft.

The most cosmopolitan, perhaps, of all mosses. It has been recorded from the island (as *F. calvescens*) by Miss Gibbs in her work on Dutch N.W. New Guinea, p. 65.

BRYACEÆ.

Bryum papuanum, Dixon, sp. nov. (Pl. **28.** fig. 1.)

(§ *Cæspitibryum?*) Dense cæspitosum, humile, vix 1 cm. altum, lutescens, ætate *purpurascens*. Folia conferta, subcomosa, siccitate *parum mutata, scariosa*, nitidiuscula, erecta, madida erecto-patentia; *late ovato-oblonga*, infra purpurea, haud decurrentia, concavo-carinata, *acuta vel brevissime acuminata*, circa 2 mm. longa, ·5 mm. lata, marginibus e basi ad apicem fere fortiter revolutis, integris (raro ad apicem obsolete denticulatis); costa sat valida, purpurascens, ad basin circa 60 lata, supra flexuosa, *in cuspidem longam validam rigidam integram vel subdenticulatam* excurrens. Areolatio firma, e cellulis basilaribus purpureis paullo latioribus, rectangularibus, supra

multo angustioribus, valde incrassatis, lineari-rhomboideis instructa, cellulis marginalibus seriebus pluribus angustis valde incrassatis, *limbum purpurascentem* instruentibus. Dioicum videtur. Folia perichætialia angustiora, acutiora. Seta brevis, 1–2·25 cm. alta, *tenuis*, rubra, *infra thecam abrupte arcuata*, theca pendula vel subpendula, *parva*, vix 3 mm. longa, *fusca vel fusco-rubella*, e collo *perdistincto, angusto abrupte dilatata, obovata*, operculo conico, vix apiculato, subnitido. Theca deoperculata *macrostoma, subhemisphærica* ; peristomium carneum, ·5 mm. altum, dentibus *ad basin confluentibus, membranam internam aurantiacam*, formantibus, *lamellis* 3–5 *remotis perincrassatis valde aurantiacis* præditam ; dehinc dentibus *latis, perapproximatis*, anguste pallide marginatis, *densissime trabeculatis, distincte, valde regulariter transverse striolatis*, linea media tenui angulata notatis, apicem versus abrupte subulatis, pallidioribus, tenuiter papillosis. Endostomii membrana basilaris *alta* (circa ⅗ dentium altitudinem æquans) lutea, tenerrime papillosa ; processus infra lati, valde hiantes, supra filiformes, ciliis 2–3 *brevibus, nodosis vel breviter appendiculatis*. Spori 9–12 μ.

Camp XIII, 10,300 ft. (No 24).

The exact position of this species is not very clear ; the narrow incrassate cells suggest the *Alpiniformia* Section, but the leaf form, stoutly excurrent nerve, and capsule hardly agree there. The form of the capsule, and the broad, almost connate peristome teeth, very densely lamellate, and very highly and strongly papillose on the dorsal surface, are rather marked characters, as is also the unusual basal, annular membrane from which the outer teeth spring, somewhat resembling that of the *Hæmatostoma* Section, but much higher, and reaching well above the orifice of the capsule.

Of this genus, the largest among mosses, the only other species that I have seen recorded from New Guinea is the almost cosmopolitan *B. coronatum*, Schwaegr.

HYMENODONTOPSIS, Herzog *.

Habitus Rhizogonii specierum graciliorum ; folia omnino Rhizogonioidea. Flores ♀ laterales. Seta tenuis, elongata. Theca erecta, ovalis, pachydermica, operculo maximo, e basi conica thecæ longitudinem fere æquante longe acutissime subulato. Annulus nullus. Peristomium simplex ; externum nullum, internum e membrana basilari sat alta, processubus 16, circa ·4 mm. altis subulatis, valde nodosis, lævibus, linea media angusta. Stomata nulla.

HYMENODONTOPSIS RHIZOGONIOIDES, Dixon, sp. nov. (Pl. **28.** fig. 2.)

Habitus *Hymenodonti sericeo* vel speciebus nonnullis minoribus Rhizogonii similis fere ; caulis usque ad 6 cm. altus, infra *densissime tomentosus*, superne luteo-viridis, erectus, gracilis, hic illic parce divisus. Folia laxiuscule disposita, erecto-patentia, siccitate parum mutata, leniter incurva, 1·5–

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* See note at end of paper, p. 509.

1·75 mm. longa, *e basi parum angustiore, lanceolata, sensim angustata*, acuta, concavo-carinata, subfragilia, *pellucida*, marginibus *plerumque bistratosis vel potius bi-alatis* hic illic unistratosis, e medio folio dentibus *sæpius gemellis*, sat remotis, brevibus, apicem versus longioribus magis approximatis præditis; costa *valida*, apud basin circa 50 μ lata, apicem versus dorso leniter spinuloso, in cuspidem brevem vel mucronem robustum, rigidum leniter denticulatum excurrens. Cellulæ *omnes fere homogeneæ, breviter irregulariter rectangulares* (2×1) vel subquadratæ, sat magnæ, circa 13 μ latæ, parietibus incrassatis pellucidis, basilares paucæ tantum juxta costales longiores, angustiores (circa 3×1); omnes lævissimæ, pellucidæ.

Dioicum videtur. Flores ♂ haud visi. Perichætialia *lateralia*, parva, paucifolia, foliis omnibus e basi ovata breviter anguste acuminatis, suberectis, aurantiacis, marginibus haud limbatis, subdenticulatis; reti angustiore, laxiore, e cellulis lineari-hexagonis haud incrassatis instructo; costa tenuiore vix excurrente. Archegonia circa 5, paraphysibus filiformibus æquilongis. Seta 2–3 cm. longa, pertenuis, rubra; theca suberecta, operculata circa 3 mm., deoperculata circa 1 mm. vel paullo ultra longa, e collo angusto defluente late ovata, deoperculata *hemisphærica*, ore latissimo; castanea, pachydermica; exothecii cellulæ irregulares, hexagonæ, incrassatæ, orificium versus 2–3 tantum seriebus minores subrectangulares. Annulus nullus. Operculum e basi *magna* (circa dimidiam thecæ partem instruens) *longe acutissime leniter oblique subulata*. Endostomii membrana circa ·15 mm. alta, aurantiaca, papillis obscura, e reticulationibus irregularibus transverse elongatis numerosis instructa. Processus (*cf.* descr. generis) flavi, pellucidi, irregulariter nodosi, ad basin distantes, sed hic illic articulatione singula conjuncti. Spori 24–30 μ, læves vel sublæves.

Camps XIII–XI, 10,300–8075 ft., Feb. 1913.

This remarkable plant connects the genera *Rhizogonium* and *Hymenodon* in an interesting manner. *Hymenodon* differs from the former genus widely in the foliation, and also in the peristome, which is reduced to an endostome only, of 16 narrow processes from a distinct basal membrane. The present genus has a fundamentally similar peristome, though differing in minor details, but the foliation is totally different from that of *Hymenodon*, while extremely like that of certain species of *Rhizogonium*, such as *R. bifarium*, *R. medium*, etc.; the cells are, however, larger and more pellucid.

A very curious feature is the structure of the capsule, the lid forming a very large proportion of the whole, so that the line marking the orifice is almost equatorial; consequently the deoperculate capsule is wide-mouthed and hemispherical.

The stems are so intensely matted below with tomentum, and at the same time so fragile, that it is difficult, if not impracticable, to separate them; I have not been able to detect any ♂ flowers, and suspect that the plant is dioicous; the inflorescence is indeed probably that of *Hymenodon*.

BARTRAMIACEÆ.

PHILONOTIS CALOMICRA, Broth.*
Camp I, 500 ft. (No. 19), c. fr.

BREUTELIA LONGICAPSULARIS, Dixon, sp. nov.

E procerrimis generis. Habitu *B. arundinifoliæ* (Duby), vel *B. aciphyllæ* (Wils.). Caulis usque ad 20 cm. altus, robustus, basin versus tantum tomentosus, purpureus, dense foliosus ; folia aureo-straminea, ad unum latus spectantia, erecto-patentia, vel squarrosa, vel hic illic, præcipue superne, deflexa, apicalia stellatim patentia; siccitate *leniter regulariter pluriplicata* ; ad 1 cm. longa vel paullo ultra, e basi amplexicauli subquadrata saturate aurantiaca pluriplicatula in laminam anguste lanceolatam sensim acutatam plicatulam angustata ; costa *angusta*, inferne male definita, ad apicem in cuspidem strictam subrobustam dentatam excurrens; marginibus *per totam fere laminam dense argute serrulatis.* Cellulæ omnes (basilares exceptæ) angustissime lineares, *perincrassatæ, valde porosæ,* dorso *humiliter* papillosæ. Alares seriebus circa quinque magnæ, laxæ, hyalinæ, pernotatæ, a ceteris plica profunda sejunctæ.

Seta 5–6 *cm. alta,* robusta, rubra, erecta ; perichætium parvum, bracteis brevibus, a foliis caulinis, ut videtur, haud multo dissimilibus. Theca e collo abrupte pendula, *cylindrica,* sicca sub ore constricta, dense leniter plicato-striata, 9 *mm. longa,* 2 mm. lata, castanea, haud nitida; operculum haud visum. Peristomium ·5 mm. altum, externum rubrum, dentibus firmis, opacis, late breviter lanceolatis, intus alte dense cristato-lamellatis ; internum aurantiacum, processubus latis, inferne conferte lamellatis, dense minute striolato-papillosis. Cilia ?

Only a single sterile stem and part of a fertile stem were collected of this ; sufficient, however, to show it to be one of the finest species of the genus, while the single capsule fortunately present establishes it as a very clearly defined species. The only species at all approaching it in the form and size of the capsule is *B. arundinifolia,* in which I have seen an occasional capsule 5–6 mm. long, and almost of the same form. The fruit of *B. aciphylla* (Wils.), which resembles it in habit and in the leaf-base, has not yet been found.

The character of the leaves is very striking ; they resemble much those of *B. aciphylla,* from the Andes of Quito, but are narrower and more strongly serrate, with the basal part still more strikingly orange, the whole base in fact highly coloured, while in the leaves I have examined of Wilson's plant the lower part only of the base is so (this may, however, be dependent on age). Apart from this the narrow upper cells with the walls highly incras-

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[*] I have been unable to trace the publication of this species, though I have reason to believe it has been published.

sate (wider than the cell lumen) and strongly porose, are very different from any of the allied species I know.

C. Mueller has determined a species of *Breutelia* from New Guinea (Moroka, Port Moresby District, leg. Loria, No. 1585, Bryotheca E. Levier) as *B. pungentella*, n. sp., in lit., 1897. The specimen in the British Museum collection, however, is a *Dicranoloma*, with reflexed leaves and somewhat a Breutelioid habit. Is it the correct thing? In any case it is an unpublished species.

POLYTRICHACEÆ.

POGONATUM KLOSSII, Dixon, sp. nov.

P. albo-marginato, C. M., bornensi sat affine; gracile; caules 1·5–2 cm. alti, stricti; folia madida horride patentia, sicca *leniter incurvo-crispata*, 5–6 mm. longa, e basi *elongata* dimidiam partem folii æquante breviter lanceolata, subobtusa, supra sat conferte breviter dentata. Lamellæ circa 30, 6–8 stratosæ, cellula apicali sectione transversa *superne dilatata, plana vel minime emarginata*. Seta altitudine variabili, 2–4 cm. alta, tenuis; theca (immatura) curvata, horizontalis, *plicata*, papillis *densis altis* obtecta. Calyptra pallide fusca.

Camp VI *a*, 3050 ft.

A not very distinct species, though not very closely allied to any that I know. The broadly flattened apical cell of the lamellæ and the very highly papillose capsule will readily separate it from all allied species, including *P. albo-marginatum*, C. M., to which it appears to have the nearest affinity.

DAWSONIACEÆ.

New Guinea and Australasia appear to share nearly equally the claim to be considered the natural home of this magnificent family. Including the two new species described in this paper, 12 species altogether are known, of which 6 inhabit the Australasian group and 6 New Guinea. They do not vary greatly in structure, at least as regards the group of larger species, which for the most part are separated principally by dimensional characters (length of stem, leaves, and seta) and by rather minute differences in the characters of the foliar lamellæ.

Five of the six Australasian species are comparatively small in size; the remaining species, *D. superba*, R. Br., comes very near in habit to the larger New Guinea species, and has the widest distribution of all the species known (Australia, Tasmania, New Zealand, Borneo). It comes, indeed, very close to *D. gigantea*, C. Muell. It may assist in elucidating the differences and in giving a clearer idea of the newly described species if I give a Key, based considerably on that given by Brotherus ('Musci,' p. 700) of the New Guinea species. I have given *D. papuana*, F. Mueller, a species which I do not know, under both headings of leaves straight or crisped when dry; Geheeb in Bibl. Bot. xliv. (1898) 14, describes them as "subtorquata," but he does not refer to this in his paper in the 'Revue Bryologique,' 1896, where, indeed, he says he has not been able to find any essential differences to separate it from *D. superba*. This does not imply that his later judgment considered it identical with that species, as at the time of the earlier paper the lamellæ had not been minutely studied; but it seems to imply that *D. papuana* does not show any marked difference in so macroscopic a character as the twisting of the leaves.

Key to the New Guinea Species of Dawsonia.

1.	Leaves more or less crisped when dry	2.
	Leaves straight when dry	3.
2.	Leaves 25–35 mm. long, seta 3–3·5 cm.	*papuana.*
	Leaves 9–10 mm. long, seta 2 cm.	*crispifolia.*
3.	Leaves short, appressed when dry	4.
	Leaves very long, spreading when dry	5.
4.	Stems 20–40 cm., leaves erect when moist	*Beccarii.*
	Stems 10–15 cm., leaves spreading when moist	*limbata.*
5.	Lamellæ 3–4 stratose	6.
	Lamellæ 5–9 stratose	*superba.*
6.	Apical cell of lamellæ in section much wider than the rest	*gigantea.*
	Apical cell scarcely wider	7.
7.	Lower cells of lamellæ, viewed laterally, irregularly quadrate	*papuana.*
	Lower cells of lamellæ irregularly rhomboid	*grandis.*

Note on D. ALTISSIMA, Geh.

In Rev. Bryol. 1896, pp. 73–79, Geheeb has given the outline of a proposed monograph on *Dawsonia*, to be elaborated with the help of Schliephacke. He refers there to a specimen of *Dawsonia*, collected in 1877–78 on Mt. Kinabalu, Borneo, by F. W. Burbidge, and sent to him by Dr. Beccari. This has been determined, probably by Mitten, as *D. superba*, but on account of its greater height, Geheeb considered it in all probability a different species, and named it provisionally *D. altissima*. At the close of his article he appealed to British bryologists for further information on the subject of this plant, but the request has, so far as I am aware, passed unnoticed; nor has the proposed monograph ever appeared. I recently looked through the cover of *Dawsonia* at Kew, and found there a sheet of Burbidge's *Dawsonia* from (1) "North Borneo, Burbidge, 1877–78," together with several other sheets of the Borneo plant—viz. (2) "Kina Balou, 6000 ft., Borneo, H. Low," in Herb. Hooker; (3) "Mt. Mandarin, 4000 ft., Borneo, coll. G. D. Haviland"; (4) Kinabalu, L. S. Gibbs, No. 3118.

(1) Is fruiting, the seta rather long, 2–3 cm., not very stout.

(2) Three sheets, of the male plant.

(3) Fruiting; seta short, 2 cm., decidedly stouter than in Burbidge's plant.

(4) The male plant.

These I have compared carefully with *D. grandis*, Schlieph. & Geh., and *D. superba*, Grev. Geheeb gives certain differentiating characters between the lamellæ of these two species, not all of which I have been able to confirm. They may be summarized thus:—

> *D. grandis.* Lamellæ 30 μ high, 3–4-seriate. In section, apical cell scarcely differentiated, only a little higher.
>
> *D. superba.* Lamellæ 60 μ high, 5–8-seriate. In section, apical cell considerably larger, wider.

And, in addition, the characters drawn from the face view, referred to below.

In the numerous leaves of *D. grandis* and *D. superba* I have examined, I do not find the character drawn from the apical cell at all so well defined as would appear from this. In *D. superba* from Australia I do not find the apical cell at all constantly wider than the lower ones in section. On the other hand, the characters drawn from the face view of the lamellæ I find quite good, viz. in *D. grandis* the cells of the lower series are often transversely elongate, sometimes rectangular, but more often with the vertical (and sometimes the horizontal) walls oblique, so that the cells are irregularly rhomboid.

In *D. superba* they are smaller, and are nearly subquadrate, often regularly so, though frequently somewhat irregular. The lamellæ are also constantly higher in *D. superba*, though the difference is perhaps not quite so well marked as the above figures would imply.

In *D. grandis*, when the lamellæ are viewed on the face surface, the apical cells are decidedly less strongly differentiated from the lower than in *D. superba*; this is partly due to their being nearer in size, and still more to their being less pellucid, the lumen being more or less obscure with cell-contents.

These characters, while somewhat slight, together with the fruiting characters, constitute no doubt sufficient grounds for separating the New Guinea *D. grandis* from the Australasian *D. superba*.

The Borneo *D. altissima*, Geh., is very near indeed to *D. grandis* in the structure of the lamellæ. These are usually 4-stratose, though occasionally higher. The lower cells in face view are usually fairly regularly subquadrate, as in *D. superba*. The apical cell, however, is much larger, quite empty, and pellucid, and this differentiates it at once from *D. grandis*, and in a lesser degree from *D. superba* (where the lamellæ are also much higher). This appears to give quite sufficient grounds for separating the Borneo plant from both *D. grandis* and *D. superba*.

But what about *D. papuana*, C. Muell.? This I have not seen. It is separated by Brotherus from *D. grandis*, next to which it is placed, by having the lamellæ 3-stratose, with the cells of the lower rows irregularly quadrate, instead of irregularly rhomboid in 3–4 strata as in *D. grandis*. This obviously brings it very near to the Borneo plant; but it may be assumed that the apical cell is less differentiated in *D. papuana*, the lamellæ 3-stratose instead of (generally) 4-stratose, and the leaves in *D. papuana* would appear when dry to be slightly, at least, crisped.

The Borneo plant may therefore, as Gepp has concluded (Journ. Linn. Soc., Bot. xlii. 209), be retained as *D. altissima*, Geh.

DAWSONIA CRISPIFOLIA, Dixon, sp. nov. (Pl. **28**. fig. 3.)

Stirps pro generis sat *gracilis*, 15–20 cm. alta, *perrigida*, subflexuosa. Folia suberecta, *confertissima*, siccitate *rigide falcato-crispata, circa* 10 *mm. longa vel breviora*, comalia in caulibus fertilibus longiora, siccis minus crispatis, falcatis; e basi late oblonga aurantiaca circa tertiam partem folii longitudinis æquante; marginibus e basi fere laminæ fortiter argute spinuloso-dentatis, cellulis marginalibus *incrassatis, elongatis, linearibus, limbum plus minusve notatum* instruentibus. Lamellæ circa 50, apice subcrenatæ, e cellulis subquadratis *seriebus* 6–8 superpositis instructæ, apicalibus majoribus, hyalinis, sectione transversa altioribus, *vix latioribus* quam ceteris. Seta 2 *cm. longa*, crassiuscula. Theca operculata erecta, maturitate horizontalis vel nutans, *cum operculo vix* 1 *cm. longa*. Operculum, peristomium, generis. Calyptra haud visa. Planta mascula ignota.

Camps XIII–XI, 10,300–8075 ft., Feb. 1913.

Very distinct from its congeners in the comparatively short leaves, crisped when dry, the whole plant very rigid, the capsule larger than in the allied species.

DAWSONIA LIMBATA, Dixon, sp. nov. (Pl. **28**. fig. 4.)

D. Beccarii, Broth. & Geh., affinis, sed *multo minor*, caulibus 10–12 cm. altis (in *D. Beccarii* ad 40 cm.) foliisque *brevioribus*, 1 cm. tantum longis (illius species comalia 20–21 mm.), lamellæ e cellulis 6–9 *seriebus* superpositis, cellula apicali sectione altiore, *perangusta*. Folia madida stricte erecto-patentia, sicca appressa, sæpe pulchre spiraliter, seriata, e basi pro more majora quam ea *D. Beccarii*, lamina breviore, apice *minus acuta*. Cellulæ marginales, præcipue superne, elongatæ, lineares, incrassatæ, *limbum angustissimum album, maturitate rufo-fuscum* instruentes. Planta mascula sola nota, caulis e floribus pluribus, 2–3, continua.

Camp VI *a*, 3050 ft., Jan. 16, 1913.

Distinguished at once from the other New Guinea species, except *D. Beccarii*, in the short leaves appressed when dry. That species differs in the much taller stems, and, although in the present case the stems, which innovate repeatedly from the centre of the inflorescence, may not have attained their full height, they show every indication of being on a quite different scale from that. Moreover, the lamellæ are much higher, their apical cell narrower in section, and the leaves more obtuse.

Brotherus in his diagnosis describes the leaves of the genus as "ungesäumt"—indeed, *Catharinea* is the only genus of Polytrichaceæ described as having the leaves bordered. The distinct, though very narrow, border to the upper part of the leaves here therefore appeared to me one of the strongest specific characters, and I applied the name "*limbata*" accordingly. A more recent study of some of the species, however, has shown that *D. superba* frequently has a similar, if somewhat less clearly marked, border, and this is also conspicuously present in the species described above as *D. crispifolia*. The character is therefore not unique as I had supposed. The lamellæ in this genus cover so wide a portion of the lamina, frequently when flattened out reaching very nearly to the edge, that it is not always easy to make out the exact cell-structure of the lamina.

D. brevifolia, Gepp, in Journ. Linn. Soc., Bot. xlii. (1914) 209, is very similar in the leaf-form and direction, but differs in the stems twice as tall, the leaves very erect, straight, and appressed when dry, not at all turned to one side or spirally arranged, and in the rather lower lamellæ (6–7-stratose).

DAWSONIA GRANDIS, Schlieph. & Geh. in Rev. Bryol. 1896, 76.

Camp VI *b*, 4475 ft. (Nos. 4, 5), c. fr. Camp VI *c*, 5500 ft. (No. 6), c. fr. This magnificent plant appears to be the most frequent species of the genus in New Guinea, and locally at least most abundant. Armit found it half a yard high, and Beccari speaks of wading knee-deep in *Dawsonia*. Although closely resembling *D. superba* in general appearance, and indeed in structure, it has distinct specific characters. The apical cell of the lamella in that species is stated by Brotherus to be much larger than the lower ones, while here it is approximately the same size; but, as mentioned above, I doubt the stability of this character. The lamellæ there are, however, distinctly higher than here, being composed of 5–8 rows, while here they are lower, usually of 3–4 rows only. In my note on *D. altissima* I have pointed out another character by which they may be separated. The seta also is markedly stouter in *D. grandis*, and generally longer. Brotherus gives that of *D. grandis* as 3·5 cm., that of *D. superba* as 2 cm.; I have, however, specimens of *D. grandis* with the seta decidedly less than 3 cm., while New Zealand specimens of *D. superba* in my herbarium have the seta fully 3·5 cm.

SPIRIDENTACEÆ.

Spiridens Reinwardtii, Nees, in Nov. Act. Acad. Cæs. Leop. xi. pt. 1 (1823) 144.

Camp VI *b*, 4475 ft. (No. 22), c. fr. Camps IX–X, 5600–6300 ft. (No. 7), c. fr.

Fleischer ('Musci der Flora von Buitenzorg,' ii. 637) makes *S. longifolius*, Lindb., a subspecies of *S. Reinwardtii*, and Herzog (Hedwig. xlix. 119) concludes that it is not to be separated at all, specifically. From an examination of numerous specimens of the New Guinea plant, I am of opinion that Herzog's conclusion is the correct one. *S. longifolius* will therefore become a synonym of this species.

NECKERACEÆ.

Endotrichella Campbelliana, Hampe, in Linnæa, xxxviii. (1874) 665.

Camp VI *a*, 3050 ft. (No. 10), c. fr. Camp I, 500 ft.

Floribundaria finisterræ, Herzog, in Hedwig. xlix. (1910) 124.

Camp VI *b*, 4475 ft. (No. 17). I have not seen authentic specimens, but, from the size and branching, the slightly glossy leaves, and distinct alar cells, I think it no doubt belongs here.

The characters given, however, scarcely seem to justify its separation from the variable and widely distributed *F. floribunda*.

HOOKERIACEÆ.

Chætomitrium, Dozy & Molk.

This extremely interesting genus, both on account of its frequently striking structural characters and its limited geographical distribution, has one at least of its centres of dispersion in New Guinea. Of 37 species listed by Brotherus, 8 are found in New Guinea, 5 of these being endemic. To these must be added *C. recurvifolium*, Fleisch., and *C. Roemeri*, Fleisch., together with the two new species described below, adding 4 more to the endemic species on this island.

Chætomitrium lævisetum, Dixon, sp. nov. (Pl. 28. fig. 5.)

C. recurvifolio, Fleisch., affine. E descriptione et tabulis ejus species tamen planta nostra optime differt statura *minore*, graciliore, densiore, foliis ramulinis *minus recurvatis*, *potius horizontaliter patentibus*, confertioribus, *multo minoribus*, vix 5 mm. longis, latioribus, *suborbicularibus*, acumine vix torto; foliis perichætialibus internis latioribus, superne *abrupte cuspidatis*, *nec sensim angustatis*, marginibus *valde spiculoso-dentatis*, *seu ciliatis*, seta tenui *omnino lævi*, calyptra densissime *brevissime* setulosa.

Camp III, 2500 ft. (No. 29), Jan. 1913.

This species differs quite widely from *C. recurvifolium* in the characters italicized above. *C. rigidulum*, Brotherus, has the leaves more nearly of the same form, but has the seta spiculose, as indeed have all the known species of this group.

The seta is 2·5 cm. long; capsule inclined, wide-mouthed, smooth or very lightly mamillose. Peristome large, red.

CHÆTOMITRIUM PERLÆVE, Dixon, sp. nov. (Pl. **28**. fig. 6.)

Sat robustum; *pulchre luteo-aureum, sericeum*; caules longe repentes, densissime pinnato-ramosi, ramis erectis, brevibus, obtusis. Folia caulina e basi subauriculata oblonga, *breviter oblique acuminata*, acumine subundulato, acuto; perconcava, *profunde pluriplicata*, pellucida, *integra vel subintegra*; cellulæ angustissime lineares, infimæ laxiores, pellucidæ, omnes *lævissimæ*. Folia ramulina similia, minora, brevius acuminata. Folia perichætialia elongata, sensim longe filiformi-acuminata, undulata, remote runcinato-dentata. Seta circa 2 cm. alta, crassiuscula, *lævis*. Theca inclinata, curvata, sub ore paullo constricta, *badia, lævis*. Calyptra *omnino fere glabra, nitida*, apice tantum parcissime setulosa.

Camp III, 2500 ft. (No. 30), Jan. 1913.

Very distinct from any of the known species in the characters above noted, especially in having cells, seta, and capsule quite smooth, and the calyptra almost entirely so.

HYPOPTERYGIACEÆ.

CYATHOPHORUM SPINOSUM, Fleisch. in sched. (Musc. frond. Archip. Ind. No. 249) (*Hookeria spinosa*, C. Muell., Syn. ii. 677).

Camp VI *b*, 4475 ft. (No. 9).

Very near *C. Adiantum* (Griff.) Mitt., but larger in all its parts, and with some slight differences in structure. Fleischer described it later as *Cyathophorella spinosa*, and records it from British New Guinea.

C. Loriæ, C. Muell., appears to me to be an undeveloped form of this.

RHACOPILACEÆ.

RHACOPILUM SPECTABILE, Reinw. & Hornsch. in Nov. Act. Acad. Cæs. Leop. xiv. (1829) 721.

Several gatherings were made of this, from Camps VI *b*, VI *c*, and Camps VIII–IX, all c. fr. One or two of the forms are very robust, and come near, apparently, to *R. nova-guinense*, Fleisch. (Hedwig. l. (1911) 285). I do not find it easy, however, from the description and figures, to grasp the differences between it and *R. spectabile*.

THUIDIACEÆ.

THUIDIUM SCABRIBRACTEATUM, Dixon, sp. nov. (Pl. **28**. fig. 7.)

Pallide luteo-viride. Caulis repens, sat robustum, elongatum, *tri-pinnatum*;

paraphyllia *parcissima*, brevia; rami ramulique complanati, remotiusculi. Folia caulina *triangulari-ovata,* haud acuminata, *obtusa,* raro acutiuscula, concava, vix plicatula, marginibus integris, seu cellulis marginalibus prominente minute crenulatis, planis vel uno alterove angustissime recurvo; cellulæ irregulariter rhomboideo-ellipticæ, *pellucidæ*, leniter papillosæ. Folia ramulina erecto-patentia, siccitate parum mutata, concava, late ovalia, subobtusa, perpellucida, costa *brevi, angustissima, inconspicua*; cellulis elliptico-rotundis, unaquaque papillam sat altam sursum vergentem gerente.

Dioicum. Perichætium insigne, bracteis patentibus, e basi *brevi* latiore triangulari sensim longissime loriformibus, flexuosis, *haud ciliatis,* costa valida apud dimidiam partem desinente, *marginibus toto ambitu grossiuscule irregulariter dense runcinato-denticulatis, dorso papillis prœaltis,* 2–3 *cristatis, valde spiculosis vel hispidis.* Fructus ignotus.

Camp VI *b*, 4475 ft., 2 Feb. 1913.

Allied perhaps to *T. glaucinoides,* Broth., in the form and structure of the leaves, but the branching is more delicate, the ramuline leaves different, and the perichætial bracts much more finely pointed and very remarkably spiculose at back.

HYPNACEÆ.

ECTROPOTHECIUM RUFULUM, Fleisch. in Nova Guinea, xii. 123.

Camps IX–X, 6000–8000 ft. (No. 49). A fragment was also picked out of *E. dentigerum*—Camp VI *b*.

This agrees well with Fleischer's description and figures. The ♂ plant only was found, a single stem, the flowers numerous, on the branches; rather large, turgid, the bracts numerous, closely imbricated, shortly and widely acuminate.

? ECTROPOTHECIUM ARFAKENSE, Broth. & Geh. in Bibl. Bot. xliv. 24.

Camp XIII, 10,300 ft. (No. 36).

A very small quantity of this plant was collected, apparently agreeing with *E. arfakense*; but I have seen no specimens, and indeed the original description of the species, itself described from poor material, is scarcely full enough to justify an exact determination.

ECTROPOTHECIUM DENTIGERUM, Dixon, sp. nov. (Pl. **28.** fig. 8.)

Robustum. *Sordide viride,* nitidum. Caulis, ut videtur, suberectus, haud prostratus, usque ad 7 cm. longus, *remotiuscule sat regulariter pinnatus,* ramis crassiusculis, curvatis, circa 1 mm. longis, obtusis. Folia regulariter *fortiter falcato-decurva*, siccitate vix mutata, caulina 1–1·5 mm. longa, vel paullo ultra, e basi *latissima* triangulari vel subquadrata breviter cito angustata, acumine *brevi filiformi integro*; haud plicata, concava, enervia; cellulæ laxiusculæ, parietibus tenuibus, *rhomboideo-lineares,* 7–8 μ latæ, pellucidæ;

basin versus *sensim latiores, breviores*, laxæ, infimæ ellipticæ, vesiculosæ, hyalinæ, alares numerosæ, magnæ, pellucidæ, *auriculas majusculas decurrentes* instruentes. Folia ramea minora, angustiora, acumine latiore, sæpe subdenticulato.

Dioicum. Perichætium e medio cauli, *magnum*, bracteis internis *erectis, arcte appressis*, e basi late vaginante externis sensim filiformi-acuminatis, internis magis abrupte in acumen brevius filiforme, subintegrum contractis, *ad basin acuminis dentibus paucis longis laceratis*. Seta elongata, ad 5 cm. alta, crassiuscula, lævis, apice cygneo-arcuato; theca *magna*, circa 4 mm. longa, turgide ovata, pendula, ad basin in setam abrupte coarctata, sicca deoperculata sub ore constricta, fuscescens; operculo magno, *exacte conico*, acuto; peristomium magnum, saturate purpureum.

Camp VI *b*, 4475 ft., 2 Feb., 1913 (No. 42). Forma minor, densius pinnata, Camp III, circa 2500 ft. (No. 37).

Near perhaps to *E. goliathense*, Fleisch., but less robust, stem-leaves wider and shorter, not plicate, basal and alar cells laxer and more distinct. The toothing of the inner perichætial leaves is very notable, resembling that of *Plagiothecium Miquelii* (Bry. Jav.).

No. 37 is very different in habit, smaller, more densely pinnate, and may be a different species, but the structural characters seem practically identical.

ECTROPOTHECIUM AUREUM, Dixon, sp. nov. (Pl. **28**. fig. 9.)

Dense cæspitosum, *pulchre aureo-flavescens*, nitidum, caulibus prostratis, 5–8 mm. longis, subæqualibus, graciliusculis, *dense* pinnatis, ramis brevibus, 5–8 mm. longis, subæqualibus. Folia *fortiter falcato-decurva*, caulina usque ad 2 mm. longa, e basi deltoideo-triangulari sensim in acumen subulatum plus minusve elongatum, denticulatum, angustata, *plicatula*, ecostata, marginibus planis, *ubique denticulatis*; cellulæ *anguste lineares, breviusculæ*, densæ, marginales subsimiles, basin versus *parum latiores*, breviores, alaribus pluribus, parvis, 1–2 *ad angulos extremos magnis, hyalinis, vesiculosis*. Folia ramea angustiora, brevius acuminata, sæpe dense argutius denticulata.

Dioicum. Perichætium breve, vaginula crassa, bracteis *parvis*, brevibus, acumine flexuoso, dentato. Seta 2 *cm. alta* Theca ignota. Flores masculi in caulis axi numerosi.

Camp VI *b*, 4475 ft. (No. 23 *a*). Camp III, 2000–3000 ft. (No. 2, *pp*).

A pretty little species, nearest, perhaps, among the dioicous species with short seta to *E. tapes*, Broth. This, however, is described as bright green, with wider cells. It is, however, a species which I do not quite understand. Brotherus describes it as dioicous and sterile only; but the Kew specimen (leg. Giulianetti) is in large quantity, is autoicous, with numerous capsules, and can hardly be the plant described by Brotherus. The colour, however, which appears to be a specific character, would alone distinguish his species from this.

ECTROPOTHECIUM LAXIRETE, Dixon, sp. nov. (Pl. **28**. fig. 10.)

Habitu *E. aureo* subsimile, sed luteo-viride, *laxius*, *minus regulariter*, *interrupte pinnatum*, gracilius. Folia caulina e basi *anguste triangulari* sensim acuminata, acumine filiformi, denticulato, 1·5 mm. longa, decurvo-falcata, acumine siccitate flexuoso, haud plicata, ecostata, *perpellucida*; cellulæ *laxæ*, *elongate*, *rhomboideo-lineares*, 6–9 μ *latæ*, *parietibus tenuissimis*; infra sensim latiores; omnes, nisi serie infima alaribusque, prosenchymaticæ, alares *paucæ*, *rectangulares*, *hyalinæ*. Folia ramea minora, brevius, latius acuminata, fortius denticulata, *perpellucida*, e cellulis eis foliorum caulinorum similibus sed *marginalibus distincte latioribus*, brevioribus. Dioicum. Perichætii bracteæ plicata, in acumen filiforme, subintegrum, squarrosum sensim angustata. Seta 2·5–3 cm. longa, *tenuis*, lævis, apice cygneo-arcuata, theca minuta, lævis, pendula, elliptica, maturitate subrotunda, sub ore constricta: operculo conico, breviter tenuiter rostrata-subulato.

Camp III, 2000–3000 ft. (No. 21). Camp VI *a*, 3050 ft. (No. 33 *b*).

Mixed to some extent with *E. aureum* this species was at first sight not easy to separate, but under the microscope the cell-structure at once distinguishes it; the cells are not remarkably wide, though wide for the size of leaf, but, being quite empty and the walls extremely thin, the texture is remarkably delicate and pellucid; and in the branch-leaves the marginal cells form a still more hyaline border; the leaves are less strongly falcate than in the two previous species.

PLAGIOTHECIOPSIS OBLONGA (Broth.), Broth. MS. comb. nov.* (Syn. *Ectropothecium oblongum*, Broth. in Öfv. Finska Vet.-Soc. Förh. xxxvii. (1895) 170. *Vesicularia oblonga*, Broth. in Engler & Prantl, Pflanzenfam., Teil i. Abt. 3. II. 1095.) (Pl. **28**. fig. 11.)

Sordide olivaceo-viridis; caulis repens, sat robustus, 4–5 cm. longus, irregulariter pinnatim ramosus, ramis 1–1·5 cm. longis, obtusis, compressis. Folia caulina decurvo-falcata, late ovata, brevissime late acuminata, acumine falcato, acuto, integro; concava, omnino fere ecostata, raro obsolete bicostata, marginibus planis; cellulæ rhomboideo-lineares, prosenchymaticæ, 6–8 μ latæ, parietibus angustis, firmis, basin versus paullo latioribus, alaribus paucis, sensim majoribus, rectangularibus, laxis, hyalinis; omnes pellucidæ læves.

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* I had described (and distributed) this plant as *Callistomium papuanum*, n. gen. & sp. Since, however, the MS. of this paper was in the printer's hands I have ascertained its identity with a New Ireland plant collected by Micholitz in 1893, described by Brotherus originally under *Ectropothecium* as above, but now recognized by him as congeneric with a Philippine Is. moss for which he created in 1913 the genus *Plagiotheciopsis* (Philipp. Journ. Sci. viii. 87).

The genus differs from *Vesicularia* principally in the distinct structure of the peristome, and as both genus and species are little known I have let the description stand.—H. N. D., Feb. 1922.

Folia ramea latiora, breviora, obtusa vel subobtusa, vel late acuta, nunquam acuminata, perconcava, marginibus apicem versus denticulatis, cellulis brevioribus, latioribus, apud apicem multo brevioribus.

Autoicum. Flores ♂ caulini, prope flores femineas siti, minuti, gemmacei. Perichætia numerosa, bracteis brevibus, latis, sensim acute acuminatis, marginibus denticulatis, areolatione ei foliorum caulinorum simili. Seta circa 1·5 cm. alta, tenuis, lævis, theca inclinata, e collo defluente oblongo-cylindrica, lævis, operculo conico, curvirostrato; sub ore leniter constricta, valde leptodermica, e cellulis magnis, hexagonis, infra os parum mutatis, paullo tantum minoribus instructa, parietibus angustis, mollissimis, aurantiacis.

Peristomium majusculum, 1 mm. fere altum, luteum. Dentes externi stricti, rigidi, fragillimi, siccitate pulchre arcuato-incurvi, angustissimi, lutei, late pallide marginati, crassi, dense trabeculati, trabeculis utraque pagina prominentibus, externe linea media subrecta notati, infra transverse oblique, tenuiter striolati, supra læviusculi. Endostomium e membrana basilari circa 120 μ alta, pallide aurantiaca, processubus angustissimis, subulatis, per totam fere longitudinem angustissime rimosis, sat remote trabeculatis, flavidis, tenuissime papillosis. Cilia nulla. Spori circa 18 μ lati.

Canoe Camp, 150 ft., Oct.–Nov. 1912 (No. 32).

This moss appears to have grown in moist—perhaps swampy—surroundings. Its generic position is doubtful, but I think it is probably of Plagiothecioid affinity, with some relationship to the South American genus *Syringothecium*, Mitt.; but in some respects it suggests Entodontaceæ, in the neighbourhood of *Stereophyllum*. The structure of the capsule-wall is, as well as the peristome, distinctive.

SEMATOPHYLLACEÆ.

SEMATOPHYLLUM HERMAPHRODITUM (C. Muell.), Besch. Fl. Bryol. Nouv. Caled. 237.

Camp VI *a*, 3050 ft. (Nos. 26, 33), c. fr.

SEMATOPHYLLUM LEPTOCARPON, var. CYLINDRICUM (Reinw. & Hornsch.), Dixon, comb. nov. (*Hypnum cylindricum*, Reinw. & Hornsch. in Nov. Act. Acad. Cæs. Leop. xiv. (1829) 2, 728. *Trichosteleum leptocarpon*, var. *cylindricum*, Fleisch. in sched.)

Camp VI *b*, 4475 ft. (Nos. 1, 3), c. fr.

TRICHOSTELEUM WERNERI, Herzog in Hedwig. xlix. (1910) 126.

Camp III, circa 2500 ft. (No. 35), c. fr. Camp VI *b*, 4475 ft. (No. 28), c. fr.

This agrees quite well with Herzog's description; the characteristic

peristome is well shown, the outer teeth deeply sulcate on the median line, and very highly cristate-lamellate within. The lid (not described by Herzog) is nearly flat with a short apiculus. The papillæ on the cells are very variable, and are often very indistinct.

TRICHOSTELEUM CAPILLARISETEM, Dixon, sp. nov.

Epiphytum in foliis vetustis. Pergracile, cæspites densos tenuissimos extensos pallidos formans. *T. Levieri*, Broth. & Geh., et *T. keriano*, Broth., affine; ab hoc seta paullo tenuiore, *longiore*, ab utroque foliis confertioribus, minus divaricatis, mollioribus, *papillis multo tenuioribus, sæpe indistinctis, paucioribus*; et præcipue *bracteis perichætialibus internis dente magna quoque latere ad acuminis basin* præditis. Seta *tenuissima, capillaris*, lævis, 1–1·5 cm. longa; theca perminuta, suberecta, macrostoma, superne mamillosa, sicca deoperculata sub ore *haud contracta*; operculum longe curvirostre. Spori 20–22 μ.

Canoe Camp, Oct.–Nov. 1912 (No. 34).

This pretty and delicate little moss covers the surface of large leaves in a very thin, closely appressed sheet. It belongs to a small group, to which the two species named in the diagnosis and one or two others belong, of somewhat similar habit and leaf-structure, and with extremely delicate seta. In the present case the seta is much finer than the finest human hair. Their generic position is somewhat doubtful; they have been referred to both *Trichosteleum* and *Taxithelium*, and, indeed, as Fleischer states ('Nova Guinea,' viii. 749), form a connecting link between the two. The lid is generally short and unlike *Trichosteleum*, and the form and position of the capsule varies much.

T. Levieri differs, in addition to characters mentioned above, in the more distinct papillæ and larger spores (25–30 μ). *T. Werneri* is larger in all its parts.

The alar cells are not at all strongly marked, being confined to 1–2 oval, hyaline cells, much larger than the adjacent ones, but not at all conspicuous as compared with many species of the genus.

HYPNODENDRACEÆ.

HYPNODENDRON PARVUM, Dixon, sp. nov. (*Mniodendron parvum*, C. Muell. in sched. ined. *M. nanum*, C. Muell. in sched., fide Brotherus.)

H. Chalmersii, Mitt. (*H. fusco-aciculare*, C. Muell.), *H. samoano*, Mitt., vel *H. spininervio* (Hook.), habitu simile, sed gracilius, ramis paucioribus, elongatis. Stipes stricta, usque ad 4 cm. alta, haud tomentosa, foliis squamiformibus *e basi erecta patentibus*, breviuscule acuminatis obtecta. Rami *pauci*, dendroidei, subpinnatim ramulosi; folia *laxiuscula*, rigide patentia, e basi latiore in acumen lineari-lanceolatum, robustum, acutum angustata.

Costa sat valida, superne *haud angustata*, apice spinoso-dentata. Folii margines *bistratosi*, dentibus *sæpe geminatis* validis e basi fere fortiter spinosi. Cellulæ *breves*, irregulares, hexagono-rhomboideæ, etc. Setæ 2–7 aggregatæ, ad 5 cm. altæ, crassiusculæ; theca inclinata, horizontalis vel leniter nutans, cum operculo 1 cm. vel paullo ultra longa, paullo curvata, plicata, operculo magno, valide longe subulato-rostrato.

Camp VI *b*, 4475 ft., 29 Jan., 1913 (No. 39). Camps IX–X, 6000–8000 ft. (No. 40). In montosis Mo-roka, Distr. Moresby, Brit. New Guinea, leg. L. Loria, det. C. Mueller, No. 1638; Bryotheca E. Levier.

I have compared the Wollaston Expedition plant with Levier's specimen in the British Museum collection, and it agrees quite well; one or two of the stems in the latter specimen have slightly denser branching, but this is inconstant and of no great importance. The species has not, I believe, been described, and as Loria's specimen is sterile, I have made the Wollaston plant the type.

Brotherus makes *H. parvum* a synonym of *H. nanum* (C. Muell.), but, as I have not been able to see a specimen of the latter, and as both names are unpublished, I have retained that which I have been able to identify with the Wollaston Expedition plant. C. Mueller gives both plants as *Mniodendron*, and Brotherus places them under the Section *Comatulina* of that genus, but from the short, mostly parenchymatous cells I think it must be placed under *Hypnodendron*, subgenus *Limbella*.

H. parvum resembles in some degree the plant described by C. Mueller as *H. fusco-aciculare*, but the leaf-form and structure are quite different, and the squamiform leaves in that are erect and appressed. *H. fusco-aciculare*, however, must disappear as a species, for it is entirely identical with *H. Chalmersii*, Mitt. in Proc. Linn. Soc. N.S.W. vii. (1883) 103. I have a specimen of *H. Chalmersii* collected by Mrs. Musgrave (in Brit. New Guinea, in 1896), determined by Mitten himself, and agreeing quite well with his description of the original plant, and it agrees exactly with another specimen of the same collector, gathered in 1897, and determined by Brotherus as *H. fusco-aciculare*. As a matter of fact, it is very probable that both Mitten's and C. Mueller's species were described from the same gathering, as both are founded on specimens gathered by Dr. Chalmers.

HYPNODENDRON, nov. subgenus LEIOCARPOS.

Theca prælonga, haud plicata.

HYPNODENDRON AURICOMUM, Broth. & Geh. in Öfv. Finska Vet.-Soc. Förh. xl. 190.

Camp VI *b*, 4475 ft., Jan. 1913 (No. 38); and Feb. 2, 1913 (No. 41). Both c. fr.

The authors, in describing this species, refer it tentatively to *Euhypnodendron*, but remark that being sterile its position is uncertain and can be decided only when a fertile specimen is found. The present plants are both in rich fruit, which is of a striking character, and fully justifies the creation of a new and marked subgenus for this magnificent plant. The capsules are aggregated, two or more together, on stout, bright red setæ 3–3·5 cm. long; the perichætial bracts plicate, longly and rather robustly acuminate. The capsules are inclined and slightly curved, very long, attaining to a centimetre in length without the lid, and sometimes slightly over, castaneous, cylindrical, slightly curved, and quite smooth; not tapering at base, but abruptly contracted, and there swollen and tuberculous (as in *Bryum coronatum*, Schwaegr.): lid rostrate, about 3 mm. long; peristome normal, cilia long, nodose.

MNIODENDRON HELLWIGII, Broth. in Engler's Bot. Jahrb. xvi. (1892) 29.

Camp III, 2500 ft. (Nos. 46, 50). Camp VI *b*, 4475 ft. (No. 44). Camp VI *c*, 5500 ft. (Nos. 45, 47). Camps IX–X, 6000–8000 ft. (Nos. 40 *b*, 48).

No. 40 *b* has the stipes a little longer—though varying much—than in the other gatherings, which is a character given by Brotherus for *M. densirameum*, but it agrees in all other particulars with the remaining gatherings, while the leaves do not differ in any way as described for that species. I am, in fact, quite unable to separate *M. Hellwigii*, Broth., from *M. densirameum*, Broth. I have not been able to see the type of the former, but I have compared specimens of it determined by Brotherus himself (collected by Mrs. Musgrave, New Guinea, 1897) with the type-gathering of *M. densirameum* in herb. Binstead; the two are to all intents and purposes identical. The branches in *M. densirameum* reach to 2 cm., while those of *M. Hellwigii* are scarcely more than 1·5 cm., but that is absolutely the only distinction I am able to find. The nerve, moreover, margin, cells, and length of stem, as to which the descriptions indicate certain differences, are perfectly identical in both. There can be no doubt of the identity of the two.

MOSSES COLLECTED BY REV. J. B. CLARK, in 1916, near BOKU, PORT MORESBY DISTRICT, BRIT. NEW GUINEA: mostly on Mt. Durigolo, above 1000 ft.

Mt. Durigolo is a spur of the Owen Stanley Range, south of the main chain, in the neighbourhood of Boku, almost due east of Port Moresby. The specimens were in part collected near Boku, and these were not separated from the collections made on Mt. Durigolo, so that the exact localities cannot be given, but all are from a comparatively limited district, and the absence of data affects little but the range of altitude.

DICRANACEÆ.

DICRANOLOMA BLUMII (Nees), Par., var. LAXIFOLIUM, Broth. & Geh. in Bibl. Bot. xliv. 4.

(No. 1 *a*.) What I suppose to be this variety is a fine plant, growing evidently in a pendulous condition, with very long flexuose stems of over a foot in length, with distant spreading leaves rather smaller than in the usual form. Geheeb records that F. Mueller sent it from the Owen Stanley Range.

DICRANOLOMA BRAUNII (C. Muell.), Par. Ind., Ed. II.

(No. 4.) Forma *brevifolia*. A plant with extremely short leaves for this species (6–7 mm.), but structurally agreeing, I think, in every way. I am inclined to think this is a highly variable species, and rather widely spread. Rev. W. W. Watts has recently recorded it from the New Hebrides.

DICRANOLOMA DICARPUM (Hornsch.), Par., op. cit.

(No. 2.) Agreeing exactly with the Australasian plant. New to New Guinea.

Distribution. Australia, Tasmania, New Zealand.

DICRANOLOMA LÆVIFOLIUM, Broth. & Geh. in Bibl. Bot. Heft xliv. (1898) 4.

(No. 3), c. fr. This agrees quite well with the somewhat meagre description given by Geheeb. The leaf-direction is much as in *D. reflexum*, C. Muell., but the structure is nearer to *D. Billardieri*, Schwaegr., and this relationship is confirmed by the fruit, which had hitherto not been found. The perichætium is tubular, 5–6 mm. long, the bracts *very shortly apiculate*. Setæ about 1·75 cm. long, capsule cylindrical, lightly curved, with a tapering, not strumose, neck.

The same plant occurs in Rev. C. H. Binstead's herbarium as "*Leucoloma Donaldii*, Broth., n. sp.; The Gap, Mt. Owen Stanley Range, Brit. New Guinea, 1899, leg. J. McDonald." Many of the leaves here are strongly transversely undulate or rugose, but I believe this to be a merely sporadic variation, as in another tuft of the same gathering they are quite without this feature. This plant, too, is in fruit. I cannot separate it in any way from Mr. Clark's plant, and I believe both to belong to *D. lævifolium*. *L. Donaldii* is an unpublished name.

DICRANOLOMA NOVO-GUINENSE (Broth. & Geh.), Par., op. cit.

(No. 6.) I have not seen an authentic specimen, but this agrees well with the description. From the description, as well as from this specimen, I should scarcely have compared it with *D. dicarpum*, as the authors do, but rather with *D. robustum* (Hook. f. & Wils.), which is very near it. Renauld places the species under the Section *Leptoneuron*, but the description scarcely seems to imply this. The nerve in Mr. Clark's plant is rather narrow below and wider above, as in *D. setosum* (Hook. f. & Wils.).

DICRANOLOMA ARMITII (C. Muell.), Par., op. cit.

(No. 5), c. fr.

Campylopus subcomosus, Dixon, sp. nov.

(*Eu-campylopus*, Atrichi.) Gracilis, humilis, cæspitem densum, vix 1 cm. altum, *olivaceum*, inferne nigritum formans. Folia falcato-decurva, sicca *valde flexuosa*, 6–8 mm. longa, curvato-flexuosa, e basi brevi oblongo-ovata *paullo concava* sensim in subulam longam gracilem concavo-convolutam angustata, marginibus e medio folio minute conferte denticulatis, superne *dense, sat argute dentatis.* Costa lata, circa dimidiam partem folii latitudinis æquans, superne partem maximam subulæ occupans, *dorso spiculoso-denticulata*; sectione cellulas ventrales, *maximas*, inanes, duces parvos, cellulas dorsales minutas cum stereideis intermixtas exhibens, dorso haud lamellosus. Cellulæ alares fusco-purpureæ, magnæ, laxæ; *sensim* in supra-alares laxas, rectangulares (circa 2–3 × 1) incrassatas transeuntes, marginalibus sensim angustioribus, *omnibus chlorophyllosis*, superiores breviter rhomboideo-rectangulares, serie una subulæ marginali plerumque inanes, hyalinæ. Cetera ignota.

(No. 1.) This appears to be closely allied to *C. comosus* (Hornsch. & Reinw.), Bry. Jav., in the structure and areolation of the lower part of the leaves, notably in the absence of any kind of supra-alar narrow hyaline cells, the areolation being in fact subsimilar throughout, only becoming gradually smaller upwards and outwards, and passing gradually into the enlarged alar cells, which therefore do not form any well-defined auricles. The subula, moreover, is much longer and finer, and is closely denticulate throughout nearly its entire length, sharply so at apex, and is also scabrous at back. The whole plant is much shorter and more slender than in *C. comosus*, which, indeed, it does not resemble at all closely in habit.

LEUCOBRYACEÆ.

Leucobryum sanctum (Brid.), C. Muell. Syn. i. 77 *.

(Nos. 8, 10.)

Leucobryum candidum (Brid.), var. speirostichum (C. Muell.), Dixon, comb. nov. (*L. speirostichum*, C. Muell., in sched.)

(No. 7.) *L. candidum* has not I believe been recorded from New Guinea. The var. *speirostichum* is in its best-developed forms a striking plant; but all intermediates can be found in the New Zealand forms; both the smaller forms and the var. *majus* give rise to it. The smaller form corresponds to *L. Teyssmannianum*, Bry. Jav., and the larger to *L. pentastichum*, Bry. Jav.;

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* *L. sanctum* is cited by all the authorities I know of—C. Muell. Syn.; Bry. Jav.; Paris, Ind.; Fleischer; Brotherus—as *L. sanctum*, Hampe, in Linnæa, xiii. (1839) 42. There is no reference to the Javanese species there, however, and C. Mueller's in the Synopsis appears to be the earliest combination.

I am, indeed, quite unable to detect any difference between the Javan and the Australian plants. The only hesitation I feel in uniting them arises from the apparent absence from Java (and, so far, from New Guinea) of the typical form of the species, *L. candidum.*

LEUCOBRYUM CYATHIFOLIUM, Dixon, sp. nov.

Perrobustum ; habitu et colore omnino fere *L. javensis* (Brid.). Folia breviora, *obtusiora*, minus regulariter falcata, 1 cm. longa et ultra, e basi erecta, latissima, oblonga, cito in acumen subæquilongum, reflexum, late lingulato-lanceolatum angustata, acumine perconcavo, subtubuloso, *apice cucullato, cyathiformi*, dorso spiculis magnis obtusis scabro. Cellulæ marginales (lamina vera) hyalinæ inferne 4–8-seriatæ, *perlatæ, rhomboideo-rectangulares, sæpe sigmoideæ*, limbum pellucidum *distinctum, latum*, superne angustatum sed usque ad apicem bene notatum instruentes. Folii sectio *subhomostrosica*, hyalocystæ quum dorsales tum ventrales plerumque ubique unistratosæ, rarius juxta basin perpaucæ cujusque paginæ hic illic pariete transversa divisæ. Chlorocystæ per totam longitudinem *centrales.* Fructus ignotus.

(No. 9.)

A fine and very distinct species, easily to be confounded with *L. javense* from outward appearance, but quite distinct in structure. *L. javense* has the leaves "heterostrosic" in section, the section at the leaf-base showing several strata of cells both above and below the chlorocysts ; here there is a single series both ventrally and dorsally, only occasionally one or two cells on either face being transversely divided. The central or subcentral position of the chlorocysts throughout the leaf is a very unusual feature ; Cardot mentions only one similar species, *L. sericeum*, Broth., which is a quite different plant.

The very broadly obtuse, spoon-shaped leaf-apex also separates it at once from *L. javense*, as well as from most or all of the species with a similar habit. The border of the leaf also is very marked ; in *L. javense*—as in most species—it is formed of very narrow, elongate, hyaline cells, and, these being in numerous rows (often 5 or 6) near the leaf-base, it is broad and conspicuous. Here it is still more conspicuous and usually broader, not from being composed of a larger number of rows of cells, but because each individual cell is wider, two or three times as wide as in *L. javense*, or wider, especially those of the innermost row. The pores in the longitudinal internal walls of these cells are very numerous and conspicuous.

CALYMPERACEÆ.

SYRRHOPODON GEHEEBII, Par., Ind. 1248. (*S. gracilis*, Geh. in Bibl. Bot. Heft xiii. (1889) 2 ; nec *S. gracilis*, Mitt. in Seem. Fl. Vit., 388).

(No. 45 *c*.) In small quantity among other mosses. I have no doubt from the description and figures that it belongs here. *S. leucoloma*, C. Muell., has leaves entire except at the extreme apex; *S. appressus*, Broth., has more acuminate, undulate leaves, smaller base, much less distinct border, &c.

SYRRHOPODON DURIGOLENSIS, Dixon, sp. nov. (Pl. **29**. fig. 13.)

§ *Tristichi*. *S. parvicauli*, C. Muell., affinis. *Pergracilis*, glaucescens, caulis *brevissimus*; folia tristicha, sicca madida patentia, 4–5 mm. longa, e basi erecta ovata vaginante elongate ligulata, supra *parum angustata*, *subobtusa*, *quasi truncata*; costa validiuscula, teres, dorso parte superiore scabra, ad apicem percurrens vel brevissime excurrens, ibique sæpe valde scabra, fusca. Limbus folii hyalinus in parte vaginante ad basin 2–3-, superne 3–4-seriatus, integer, per totam folii laminam subæqualis, validus, *e basi fere laminæ breviter regulariter dense serrulatus, apicem versus argutius spinuloso-denticulatus*. Cellulæ laminæ regulariter quadrato-hexagonæ, circa 8 μ latæ, pellucidæ, læves; cancellinæ breviter late rectangulares vel rhomboideo-rectangulares, parietibus pertenuibus, marginem versus haud vel vix angustatæ, superne costam versus brevius scalariter ascendentes. Cetera nulla.

(No. 51.)

Of the *Tristichi* Section, this is a quite distinct species, very much shorter and smaller than its allies, *S. parvicaulis*, C. Muell., alone approaching it in size. Our plant is indeed considerably smaller than that species, which also has gradually tapering, acuminate leaves, much more distantly toothed; *S. tristichellus*, Besch., is also much taller, with leaves almost of *S. tristichus*.

RHIZOGONIACEÆ.

RHIZOGONIUM SPINIFORME (L.), Bruch in Flora, xxix. (1846) 134.
(No. 12).

? RHIZOGONIUM ORBICULARE, Dixon, sp. nov. (Pl. **29**. fig. 14.)

Stirps *perminuta*; caules dense aggregati, gracillimi, *vix* 1 *cm. alti*, hic illic divisi, *nigricantes*; sectione rotunda, reti fere homogeneo, e cellulis laxiusculis, externis parum incrassatis instructo, fasciculo centrali nulla aut indistincta. Folia *minima*, pallide viridia, *valde complanata* (serie una dorsali, altera ventrali, ceteris lateralibus explanatis) ea *Mnii hymenophylloidei* referentes sed multo minora, confertiora, pluriseriata; sicca parum mutata, leniter incurva; *facillime delapsa*; e basi brevissima coarctata, vix decurrente, *orbicularia vel suborbicularia*, obtuse apiculata, ·5–·75 mm. longa, marginibus planis *subintegris*, minutissime sinuato-denticulatis, *nullo modo limbata*; costa validiuscula, basin versus circa 25 μ lata, superne parum angustata, leniter sinuata, percurrens vel in apiculum brevissimum obtusum excurrens; sectione subteres vel plano-convexa, e

cellulis subsimilibus, parvis, substereideis, ducibus aut nullis aut reliquis subsimilibus instructa. Areolatio *homogenea fere*, e cellulis *hexagonis*, 8–10 μ latis, infimis tantum, præcipue marginalibus, paucis elongatis, breviter linearibus, omnibus pellucidis, lævibus, parietibus firmis vix incrassatis instructa. Dioicum. Perichætium *e parte inferiore vel e medio cauli ortum*, parvum, ·75 mm. longum, bracteis paucis (6–7), anguste spathulato-lanceolatis, breviter acuminatis, acutis, subdenticulatis, costa aurantiaca, percurrente, cellulis inferioribus linearibus, superioribus elongato-hexagonis vel rhomboideis, marginalibus serie unica longioribus, angustioribus. Archegonia numerosa, 10 seu ultra, vix ·4 mm. longa, paraphyses ut videtur paucissima vel nulla.

(No. 35 *b*.) Mixed with *Sematophyllum lamprophyllum*, Mitt.

The generic position of this peculiar little moss is somewhat doubtful. In habit it somewhat resembles *Mittenia*, but there the inflorescence is terminal. In outward appearance it perhaps resembles more than anything else fragmentary stems of certain species of *Pinnatella* with orbicular complanate leaves, and the nerve- and cell-structures are also not unlike. The position of the perichætium, and the structure of the bracts, however, leave little doubt that it belongs to *Rhizogonium* (or possibly to a new and allied genus). The only species at all approaching it in size known to me is *R. vallis-gratiæ* (Hampe) from South Africa, which plant is, however, of a totally different nature.

POLYTRICHACEÆ.

Pogonatum cirratum (Sw.), Brid. Bryol. Univ. ii. 110.
(No. 11.)

DAWSONIACEÆ.

Dawsonia grandis, Schlieph. & Geh. in Rev. Bryol. 1896, 76.
(No. 13), c. fr.

NECKERACEÆ.

Pterobryella papuensis, Dixon, sp. nov. (Plate 29. fig. 12.)

Stirps insignis, pulcherrima, habitu omnino *P. longifrondis* (C. Muell.) ; frondibus (una cum stipite) usque ad pedem longis, sæpius circa semipedalibus. Stipes circa 5–8 cm. alta, juventute foliis squamiformibus tenuiter aristatis erecto-appressis prædita, nuper denudata nitidiuscula fusca, superne simplex vel ramosa, in frondem magnam complanatam *pulcherrime bipinnatam* fusco-aurantiacam divisa. Folia pulchre aurantiaca, eis *P. longifrondis* similia, sed *multo latiora et breviora, multo brevius, minus anguste acuminata*, marginibus *confertius, argutius denticulatis*, costa *angustiore*. Folia ramea et ramulina multo minora, angustiora. Dioica. Flores masculi

numerosi in caulibus vel ramis principalibus siti, subcylindrici; flores feminei pauci, plerumque prope frondis apicem orti; perichætium prælongum, 1 cm. longum vel ultra, cylindricum, bracteis longe subulatis, tenuinervibus, suberectis. Seta 4 cm. alta, leniter flexuosa; theca unica visa vetusta imperfecta nigricans, pachydermica, elliptica, circa 5 mm. longa. Peristomium sat magnum, dentibus externis magnis, late triangulari-lanceolatis, crassis, fusco-purpureis, apicem versus pallidioribus, subpapillosis, inferne conferte lamellatis, densissime transverse striolatis. Endostomium aurantiacum, membrana basilari circa dimidiam partem altitudinis dentium æquante, processubus pallidioribus, sublævibus vel leniter papillosis, subpellucidis, anguste triangularibus, circa 5-lamellatis, inferne fissis. Cilia, ut videtur, nulla.

Hab. The Gap, Owen Stanley Range, Brit. New Guinea, 1899; leg. J. McDonald, in herb. Binstead, c. fr.; Mt. Durigolo, 1916, Rev. J. B. Clark. (No. 14.)

The specimens in Mr. Binstead's herbarium being in fruit, I have made them the type of the species. It is a very beautiful plant, very near to *P. speciosissima* (under which name it stood in Binstead's herbarium, determined I think by Mitten), but differing quite markedly in the leaf-characters italicized above.

I have carefully compared original specimens of *P. speciosissima* (Sull.) with the Philippine *P. longifrons* (C. Muell.), and can detect no difference whatever. *P. speciosissima*, as hinted by Brotherus, must certainly be looked upon as a synonym.

The branching is rather erratic. The stipes may be unbranched, when the frond becomes regularly elliptical; or it may send out two or three secondary divisions, each of these being bipinnately branched, in which case the frond is more flabellate; these secondary divisions, again, may be branched from the base, or they may remain unbranched for some distance up, like the main stipes, in which case the stipitate secondary frond has a peculiar appearance, such as is seen in some species of *Symphysodontella*.

(*The drawings, Pl.* **29**. *figs. b, c, exaggerate slightly the differences between the two species.*)

TRACHYLOMA TAHITENSE, Besch. in Bull. Soc. bot. France, xlv. (1898) 118. (No. 20.)

This has not previously been recorded from New Guinea. It occurs also in Herb. Binstead as "*Trachyloma indicum*, Mitt., British New Guinea, 1897, leg. Mrs. Musgrave." The two species are nearly allied and easily confused, and their geographical areas are fairly co-extensive. Fleischer, however (Musci . . . . . von Buitenzorg, iii. 719), has clearly pointed out the differences, *T. tahitense* being less glossy, with more shortly pointed leaves, and markedly different areolation, the cells in *T. indicum* being narrow and thin-walled, those of *T. tahitense* wider, with firmer, somewhat thickened walls. *T. indicum* also occurs in New Guinea.

ENDOTRICHELLA CAMPBELLIANA, Hampe, in Linnæa, xxxviii. (1874) 655.
(No. 15), c. fr.

ENDOTRICHELLA MUSGRAVEÆ, Broth. in Öfv. Finska Vet.-Soc. Förh. xlii. 106.
(Nos. 16, 18), c. fr.

This seems to be a variable plant in habit, leaf-direction, etc. There are usually two or three spicules at the apex of the dorsal furrows of the leaf, easily overlooked, but quite distinct. Brotherus describes the leaves as "marginibus revolutis," but while in the dry state the margin is very lightly and narrowly reflexed, when moist I have usually found it plane, except at the extreme base, where it may be recurved. It is a fine species.

GAROVAGLIA LONGIFOLIA, Herzog, in Hedwig. xlix. (1910) 124.
(No. 17.) I have not seen authentic specimens, but from the description the plant is certainly referable here. The leaves are very rugulose, as in *G. Bauerlenii* (Geh.), but they are much longer and narrower than in that species, and the cells are decidedly less incrassate. In the leaf-form it is decidedly nearer *G. undulata*, Ren. & Card., but the leaves there are much more coarsely toothed, and the back of the leaf is spiculose above, while the cells are strongly incrassate and porose as in *G. Bauerlenii*.

SYMPHYSODONTELLA CONVOLUTA (Dozy & Molk.), Fleisch., Musci . . . . von Buitenzorg, iii. 690.
(No. 17), c. fr. This agrees well with the Javan plant, except that the branching is a little less dense. The figure in the M. frond. ined. Arch. Ind. t. 50, does not give the perichætial bracts with points long enough; they end in long, rigid, loriform or stoutly setaceous aristæ.

It has previously been recorded, I believe, only from Java.

PAPILLARIA FUSCESCENS (Hook.) var. RIGIDICAULIS, Fleisch., tom. cit. 760.
(Nos. 23, 24, 25.) These plants seem to come under Fleischer's variety; the stems are short and rather rigid, the leaves only lightly plicate, very short-pointed, with the cells scarcely at all papillose and very incrassate. No. 25 is a less distinct form. Reduced forms of *P. semitorta* are sometimes very difficult to separate, it may be remarked.

METEORIUM MIQUELIANUM (C. Muell.), Fleisch., tom. cit. 773.
(Nos. 21, 22.)

Aërobryopsis longissima (Dozy & Molk.), Fleisch. in Hedwig. xliv. (1905) 305.

(No. 50.) Forma pseudo-lanosa (Broth. & Geh.), Fleisch.

Neckeropsis Lepineana (Mont.), Fleisch., Musci . . von Buitenzorg, iii. 879.

(No. 28.)

Homaliodendron scalpellifolium (Mitt.), Fleisch. in Hedwig. xlv. (1906) 75.

(Nos. 26, 27.)

Camptochæte subporotrichoides (Broth. & Geh.), Broth. in Engler & Prantl, Pflanzenfam., Teil i. Abt. 3. ii. 865. (*Thamniella subporotrichoides*, Broth. & Geh. in Bibl. Bot. Heft xliv. (1898) 22. *Camptochæte flagellifera*, Broth. in sched. et op. et loc. cit.)

(No. 29.) "Nova Guinea austro-orient. Brit. In montosis Mo-roka, 1300 m., distr. Moresby, 1893, leg. L. Loria. *Porotrichum Loriæ* det. C. M., No. 749, nov. sp. in lit. 1895, Bryotheca E. Levier." Brit. New Guinea, leg. Mrs. Musgrave, 1897, det. Brotherus as *C. flagellifera*, nov. sp. in sched. in herb. Binstead.

Brotherus and Geheeb described their *Thamniella subporotrichoides* on fertile specimens collected by Beccari on Mt. Arfak. From the description and figures it is extremely close to *C. porotrichoides* (Besch.), Broth., from New Caledonia, but differs according to the authors in the branch-leaves rigidly patent, never distichous, in the lid obliquely rostrate, and the cilia of the inner peristome longer and nodose only, not appendiculate. I have not seen fruit of the New Caledonian plant, but in specimens leg. Franc (comm. Thériot) the branch-leaves while usually distichous in direction are sometimes arranged all round the stem, exactly as figured by Geheeb for *C. subporotrichoides*. This character, drawn from the direction of the branch-leaves, can, I think, have no specific value; in several species of the genus it varies quite as completely within the limits of the same gathering; and precisely the same is the case in the allied genus *Thamnium*, *e.g.* in *Thamnium alopecurum* (L.) and *T. pennæforme* (Hornsch.), Kindb.; and I think the specific distinction between the New Guinea plant and that of New Caledonia must rest on the fruiting characters alone. Mr. Clark's specimen has the leaves rigidly distichous, but in other ways agrees exactly with the description and figures of *C. subporotrichoides*, and I feel no hesitation in referring it here.

I also refer to this species, though with not quite the same degree of certainty, the plants determined by Brotherus as *C. flagellifera*. Although this name is included in the 'Musci,' it is, as far as I can ascertain, an unpublished name. I have in my herbarium, *ex* Herb. Binstead, original specimens of the plant collected by Mrs. Musgrave, and I have studied the plant of *Loria* at the British Museum. I do not know which of these Brotherus considered the type of his *C. flagellifera*. Neither is in fruit, and it is difficult to know why the author places it in the Section *Eu-Camptochæte*, while *C. porotrichoides* and *C. subporotrichoides* are placed in the Section *Thamniella*. (The distinctions between these two Sections, by the way, are it must be confessed very slight—if not, indeed, illusory. Vegetatively both these plants appear to me exactly identical with the New Caledonian *C. porotrichoides*; the leaves are usually (though not always) distichous in direction, and the branch-leaves are somewhat narrower and more longly pointed than in that, or in *C. subporotrichoides* as figured. But it would be quite impossible to separate them on these grounds from *C. subporotrichoides*, since Mr. Clark's plant, with the wider, shorter-pointed leaves, distichous in direction, combines the characters of the two. Mr. Clark's, like Beccari's, has few of the flagella which are a marked feature of *C. flagellifera*, but they occur in both, and their comparative frequency can hardly be considered a specific character. In the absence of fruiting characters, therefore, I strongly incline to consider *C. flagellifera* as synonymouswith *C. subporotrichoides*, which, again, is extremely close to *C. porotrichoides*, while apparently rightly separated by the fruiting characters.

HOOKERIACEÆ.

ERIOPUS REMOTIFOLIUS, C. Muell. in Bot. Zeit. 1847, 828.
(No. 19.)

HYPOPTERYGIACEÆ.

HYPOPTERYGIUM JAVANICUM (Hampe), Jaeg., Adumbr. ii. 66.

(No. 32.) In some respects, especially in the asymmetrical leaves, more like *H. trichocladon*, Bry. Jav., which I do not find easy to separate from *H. javanicum*; but the amphigastria as well as the leaves are strongly bordered, and this seems to relegate it to *H. javanicum*.

LESKEACEÆ.

THUIDIUM CYMBIFOLIUM (Dozy & Molk.), Bry. Jav. ii. 115.

(No. 54.) Only a single stem was found, which must I think be referred here. It has not been recorded from New Guinea, but is a plant of such wide distribution in the Indian and Malayan areas that it is quite to be expected here. *T. longissimum*, Herz., appears to be of somewhat near alliance, but is distinguished at once (e descr.) by the closer, more plumulose branching, the leaves of the primary branches ovate (not as here finely acuminate), and the ramuline leaves obtuse.

HYPNACEÆ.

Trismegistia complanatula (C. Muell.), Broth. in Engler & Prantl, Pflanzenfam., T. i. Abt. 3. ii. 1078.

Trismegistia rigida (Hornsch. & Reinw.), Broth. op. et loc. cit.
(No. 43.)

Mastopoma Armitii (Broth. & Geh.), op. cit. 1074.
(Nos. 31, 36.) A sterile form with the leaves strongly falcate, giving the plant a very different appearance from that figured by Brotherus. I find, however, stems of the falcate-leaved form in original specimens at Kew, while a few of the stems here have the leaves quite straight.

Acanthocladium pinnatum, Fleisch. in Hedwig. l. (1911) 284.
(No. 42.) Of the original plant, collected by von Roemer in Dutch New Guinea, only a single sterile stem was found, and it is interesting to have its distribution widened by Mr. Clark's specimen. Here, too, only a few fragmentary stems were found, but quite sufficient to leave little doubt of its identity with this fine species. There is only one discrepancy, a slight one, with Fleischer's description. He describes the cells as "minutissime indistincte seriatim papillosis," a character which, it may be remarked, does not occur in any other species of the genus—or, indeed, in any of the genera of the sub-order Stereodonteæ. I have not detected it in Mr. Clark's plant, or very doubtfully, the papillæ only occurring very sporadically, and then usually singly.

Acanthocladium Clarkii, Dixon, sp. nov. (Pl. **29**. fig. 15.)
Caulis *elongatus*, *pendulus*, 6–8 cm. longus, *parcissime ramosus*, *flexuosus*, *flaccidus*, sensim attenuatus, haud cuspidatus, tenuis, stramineus, nitidus. Folia *laxe disposita*, *patentia*, subcomplanata, 2 cm. longa vel paullo ultra, *e basi coarctata concava anguste lanceolata, concava, in acumen angustissimum, acutum, sæpe semitortum sensim angustata*, costa brevissima, tenuissima, singula vel bina, plerumque nulla; marginibus planis, acumine *distanter* denticulatis. Rete pallidum, perdensum, e cellulis *angustissimis* longissimis lævibus parietibus sat incrassatis instructum; cellulæ basin versus paullo latiores, parietibus incrassatis, porosis, infimæ aurantiacæ; alares sat numerosæ, irregulariter rectangulares, magnæ, *auriculas opacas*, *fusco-purpureas* instruentes. Folia ramea similia, minora. Cetera nulla.
Mt. Durigolo (No. 46).
Very different in habit from the other species of the genus, and with some doubt as to its generic position. It appears to be rather nearly allied to *Sematophyllum flexile*, Ren., from Madagascar, which has been variously placed in *Sematophyllum*, *Microthamnium*, and *Acanthocladium*, and which Fleischer has made the type of a monotypic genus, *Acanthocladiella*, with

considerable justification. The alar cells, large and deeply coloured, but in several rows upward, and not vesicular, seem to indicate the present genus rather than *Sematophyllum.*

ECTROPOTHECIUM LATICUSPES, Broth., in Öfv. Finska Vet.-Soc. Förh. xl. 186.

(No. 37.) From the description of the species I have no doubt this is a not very well-grown state of it. The stem-leaves are widely triangular, with rather short and broad falcate acumen; the alar cells very few and inconspicuous.

ECTROPOTHECIUM LONGICOLLUM, Broth. & Geh., op. cit. 184.

(No. 41.) Except in the somewhat laxer branching, this agrees well with the specimen of the above at Kew.

TAXITHELIUM SUBSTIGMOSUM (C. Muell.), Broth. in Engler & Prantl, Pflanzenfam., T. i. Abt. 3. II. 1092.

(No. 33.)

TRICHOSTELEUM HAMATUM (Dozy & Molk.), Jaeg. Adumbr, ii. 486.

(No. 45 *b*) cum setis. The type, not the var. *semi-mamillosum* (C. Muell.).

TRICHOSTELEUM GROSSO-MAMILLOSUM (C. Muell.), Par. ined. (*Thelidium grossomamillosum,* C. Muell., MSS. in litt., 1895, et in Bryoth. E. Levier, No. 697.)

This name is based on a specimen of Loria's "New Guinea orientalis Brit., in montosis Mo-roka, 1300 m., distr. Moresby, 1893." It has not yet been published. The species may be diagnosed as follows:—

Habitu *T. hamato* simillimum, sed minus, foliorum structura longe aliena, cellulis *haud incrassatis, bi-pluri-papillosis, papillis grossiusculis,* cellulis marginalibus lævibus; folia *brevius acuminata,* superne *grosse, dense, argute dentata.*

TRICHOSTELEUM SEMATOPHYLLOIDES, Dixon, sp. nov. (Pl. **29**, fig. 16.)

Habitu specierum nonnullarum *Sematophylli* (e. g. *S. extensum,* Card., *S. filicuspes,* Broth., *S. pilotrichelloides,* Card. & Dixon). Caulis elongatus, *pendulus aut repens,* inter alia bryophyta intertextus, *pergracilis, flexuosus,* 5–6 cm. longus, *parce breviter ramosus,* apice *penicillatus seu cuspidatus,* pallide viridis, vix nitidus. Folia laxiuscula, madida rigide patentia, sicca magis erecta, subflexuosa, vel vix mutata, circa 1 mm. longa, e basi paullo constricta ovato-lanceolata, perconcava, *breviuscule acute acuminata,* ecostata, marginibus planis, ubique denticulatis, acumine *argute dentatis*; cellulæ lineares, obtusiusculæ, subsigmoideæ, parietibus *tenuibus,* dorso humillime indistincte pluri-papillosæ, marginales reliquis subsimiles; infimæ flavæ, alaribus circa trinis, magnis, vesiculosis, pellucidis. Folia ramea minora

brevius, latius acuminata; cellulæ *papillis magis conspicuis regulariter seriatim dispositis* notatæ. Fructus ignotus.

(Nos. 52, 44.)

The slender flexuose stems are quite different from the usual *Trichosteleum* habit of growth, much more like the species of *Sematophyllum* mentioned above, to which *S. gracilicaule* (Bry. Jav.) may be added. The leaf-form, however, together with the pluri-papillate cells, show it to be a *Trichosteleum*.

SEMATOPHYLLUM LAMPROPHYLLUM (Mitt.), Jaeg. Adumbr. ii. 453.

(No. 35.)

In small quantity; apparently referable to this species. The characters separating some of these smaller species of *Sematophyllum* are very slight; and seeing that the papillosity of the cells varies very greatly even in leaves on the same branch, I am doubtful whether *S. subulatum* (Hampe) is really specifically distinct from this species.

SEMATOPHYLLUM SIGMATODONTIUM (C. Muell.), Jaeg., Adumbr. ii. 448.

(No. 48.)

SEMATOPHYLLUM FLAGELLIFERUM, Dixon, sp. nov. (Pl. **29**. fig. 17.)

S. gedeano, Mitt., et *S. cucullifolio*, Card. & Dixon, Indiæ orientalis, affine. Ab hoc foliis densioribus, minus longe, obtusius, recte cuspidatis, ab illo foliis latioribus, multo concavioribus, brevius cuspidatis; ab ambabus speciebus foliorum areolatione incrassata porosa, differt. Vix nitidus; rami foliis confertissimis *turgidiusculi*, breves, circa 1 cm. longi, obtusi, plerumque *in flagellum curvatum caudiforme æquilongum minutifolium* desinentes. Folia *latissime ovata*, valde concava, superne marginibus late involutis, apice convoluto-cuculliformi, *breviter obtusiuscule apiculato*, integro. Cellulæ omnes *perincrassatæ*, parietibus porosis, latitudine ei luminis subæquantibus; alaribus *pernotatis*, magnis, pulcherrime saturate aurantiacis. Cetera nulla.

(No. 53.)

The three or four fragments of stems are perhaps scarcely sufficient on which to base a new species. Structurally, however, the leaves differ from any of the species to which in form they are allied, while the flagella, which occur on most of the branches, appear to be a constant feature, and are different from anything that occurs in any of the species known to me.

SEMATOPHYLLUM LEPTOCARPON (Schwaegr.), var. CYLINDRICUM (Reinw. & Hornsch.), Dixon (v. supra, p. 493).

(No. 39), c. fr.

SEMATOPHYLLUM ROSEUM, Dixon, sp. nov. (Pl. **29**. fig. 18.)

S. scalari, Braun, forsan affine, colore autem saturate *pulcherrime roseo*; cæspites perdensos, humiles formans. Caulis repens, ramis confertis erectis brevibus, vix ·5 cm. altis, leniter curvatis, subobtusis, *haud nitidis*.

Folia 1 mm. longa, e basi angusta coarctata *ovata vel elliptica, acuta, parum acuminata, perconcava, marginibus late explanatis*, e medio folio distanter minute, apicem versus argute grossiuscule denticulatis, denticulationibus *erectis, haud patentibus*. Cellulæ angustissime lineares, læves, perincrassatæ, parietibus *valde* (sed ob tenuitatem indistincte) *porosis*, infimæ aurantiacæ, alares circa trinæ vesiculosæ, incrassatæ, elongatæ, auriculas parvas *dilatatas*, bene notatas instruentes. Cetera ignota.

(No. 38.)

A very pretty and quite distinct little species. Fleischer ('Nova Guinea,' xii. 121) has separated *S. ruficaule*, Thw. & Mitt., and *S. bogoricum* (Bry. Jav.), Jaeg., as a new genus *Clastobryophilum*, and *S. cuculligerum* (Bry. Jav.), with *Trichosteleum epiphyllum*, Ren. & Card., as a further genus *Clastobryella*. The present plant would belong to one or other of these genera, but I cannot say which, as no diagnosis is given, and any generic differences between the species involved appear to me exceedingly slight. The leaves in *S. roseum* are wider and more shortly pointed than in any of these species. I have not detected any brood-filaments, such as occur in *S. cuculligerum* and *S. ruficaule*.

The areolation is rather marked. The cell-walls are thickened and highly porose, but the cells and walls being of extreme tenuity and of nearly equal width, it is not easy to distinguish the wall from the lumen, while the pores are, except under certain illumination, almost invisible; the only indication being often an apparent sinuation of the internal walls. Under other illumination the pores may appear quite clearly here and there, bearing the false appearance of being transverse cell-walls.

HYPNODENDRACEÆ.

HYPNODENDRON DIVERSIFOLIUM, Broth. & Geh. in Öfv. Finska Vet.-Soc. Förh. xl. 191.

(No. 49.) A fine species, very distinct in the dimorphous foliation of the branches. Recorded further by Miss Gibbs from N.W. Dutch New Guinea.

MNIODENDRON HELLWIGII, Broth., in Engler's Bot. Jahrb. xvi. (1892) 29.
(No. 45.), c. fr.

NOTE.—When this paper was written, during 1917, the genus *Hymenodontopsis* (see p. 480) was described as new. Since it was in type I have received the numbers of 'Hedwigia' published during the war, and I find that Herzog, in 1916, (vol. lvii. p. 235) has published a new genus of mosses under this name, based on a plant collected by Stresemann in Ceram (Moluccas); and by a very curious coincidence the genus (if not the species) is identical with the New Guinea one. Herzog has figured his plant in a later number of 'Hedwigia' (vol. lxi. p. 290). In two respects his species—*H. Stresemannii*—is described as differing by rather important characters from the New Guinea plant, viz. the perichætium is described and figured as produced on basal rhizoids; while in *H. rhizogonioides* it is lateral among the cauline tomentum; and the leaf-margin is described as "stricte revoluto," while in the New Guinea plant the margin is thickened, but in such a way that it may easily appear as revolute. On account of these characters I have retained the New Guinea moss as a separate species, but with a strong suspicion that the differences are only due to different interpretations of the observed facts, and that our plant may be found to be conspecific with the Ceram moss.

Herzog (op. cit. lxi. 293) has an interesting note on the remarkable affinity of the moss-flora of the Islands Buru and Ceram with that of New Guinea; an affinity which will be still more emphasised if, as I strongly suspect, his *Hypnodendron macrocarpum* (op. cit. lvii. 241) is identical with the New Guinea *H. auricomum* Broth. & Geh. It is probable also that my *Thuidium scabribracteatum* (ante, p. 489) may be identical with *T. himantophyllum* Herz.—H. N. D., Feb. 1922.

EXPLANATION OF THE PLATES.

(*Unless otherwise stated, the drawings are made from the type-specimens.*)

Plate 28.

Fig. 1. *Bryum papuanum.* *a.* Leaf, × 20. *b.* Upper cells, × 200. *c.* Peristome, dorsal view, × 40.

Fig. 2. *Hymenodontopsis rhizogonioides.* *a.* Plant, nat. size. *b.* Leaf, × 20. *c.* Upper cells, × 200. *d.* Capsule, × 3. *e.* Portion of peristome, × 50.

Fig. 3. *Dawsonia crispifolia.* *a.* Upper part of stem (dry), nat. size.

Fig. 4. *Dawsonia limbata.* *a.* Stem (dry), nat. size.

Fig. 5. *Chætomitrium lævisetum.* *a.* Part of branch, × 4. *b.* Leaves, × 20. *c.* Leaf-apex, × 40.

Fig. 6. *Chætomitrium perlæve.* *a.* Leaf, × 20.

Fig. 7. *Thuidium scabribracteatum.* *a.* Perichætial leaf, × 20. *b.* Portion of do., × 60.

Fig. 8. *Ectropothecium dentigerum.* *a.* Stem, nat. size. *b.* Upper part of perichætial leaf, × 40.

Fig. 9. *Ectropothecium aureum.* *a.* Stem-leaf, × 20. *b.* Upper cells, × 200. *c.* Alar do., × 50.

Fig. 10. *Ectropothecium laxirete.* *a.* Stem-leaf, × 20. *b.* Upper cells, × 200.

Fig. 11. *Plagiotheciopsis oblonga* (C. B. Kloss, No. 32). *a.* Stem, nat. size. *b.* Leaves, × 10. *c.* (between 10 *b* and 11 *d*, *e*.) Portion of peristome, × 40. *d.* Portion of base of outer tooth, ventral face, × 80. *e.* Do., dorsal face, × 80. *f.* Portion of process, × 80.

Plate 29.

Fig. 12. *Pterobryella papuensis.* *a.* Stem, about two-thirds nat. size. *b.* Apex of leaf, × 20. *c.* Do., of *P. longifrons*, C. Muell. (Philippines, Mearns & Hutchinson, 4790), × 20.

Fig. 13. *Syrrhopodon durigolensis.* *a.* Leaf, × 10. *b.* Apex of do., × 40. *c.* Areolation at shoulder, × 50.

Fig. 14. *Rhizogonium orbiculare.* *a.* Plant, nat. size. *b.* ♀ stem, × 5. *c.* Leaf, × 20. *d.* Upper cells, × 200. *e.* Perichætium, × 20.

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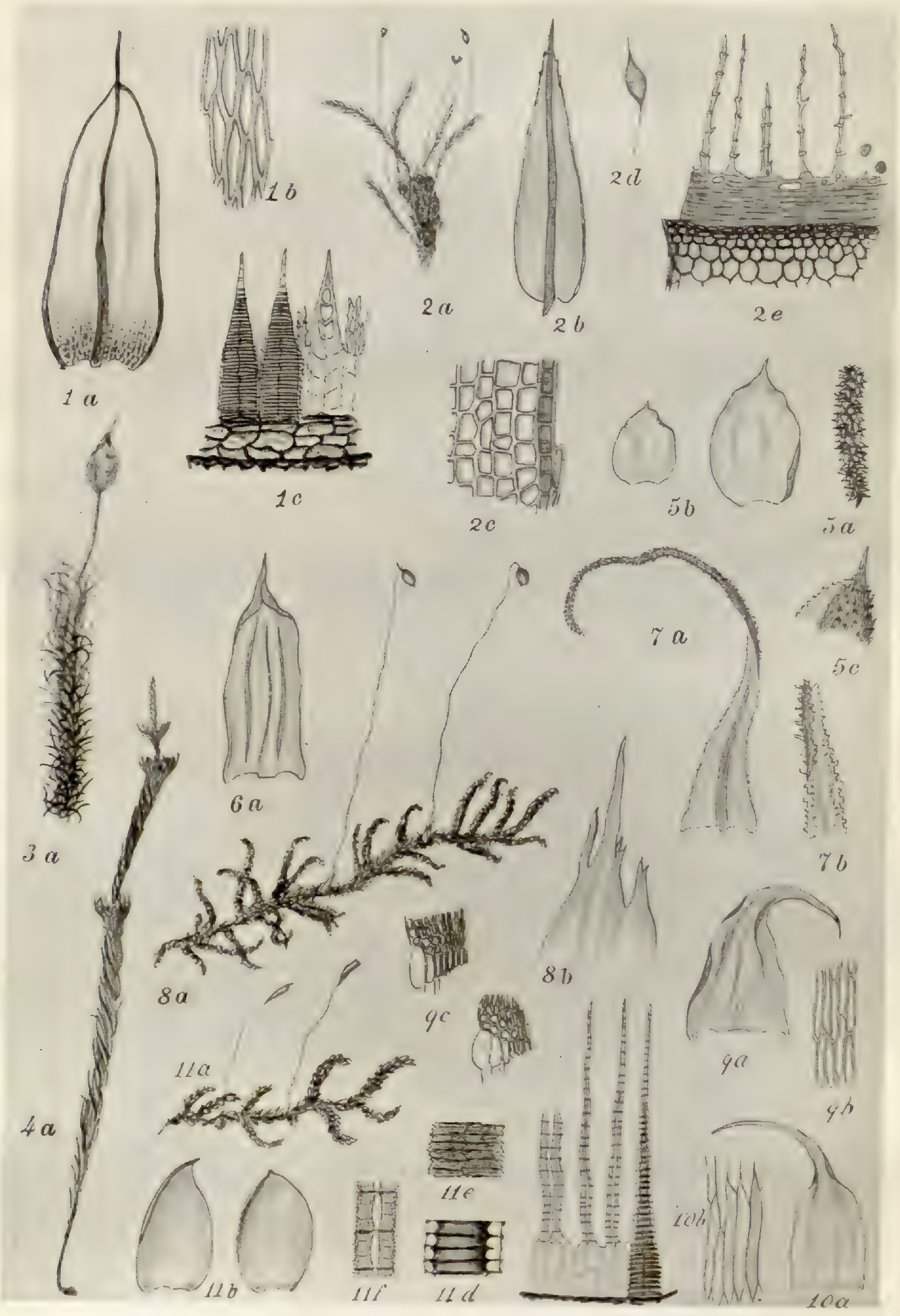
Fig. 16. *Trichosteleum sematophylloides.* *a.* Stem, nat. size. *b.* Leaf, × 20. *c.* Apex of do., × 40.

Fig. 17. *Sematophyllum flagelliferum.* *a.* Stem, nat. size. *b.* Leaf, × 10.

Fig. 18. *Sematophyllum roseum.* *a.* Leaf, × 20.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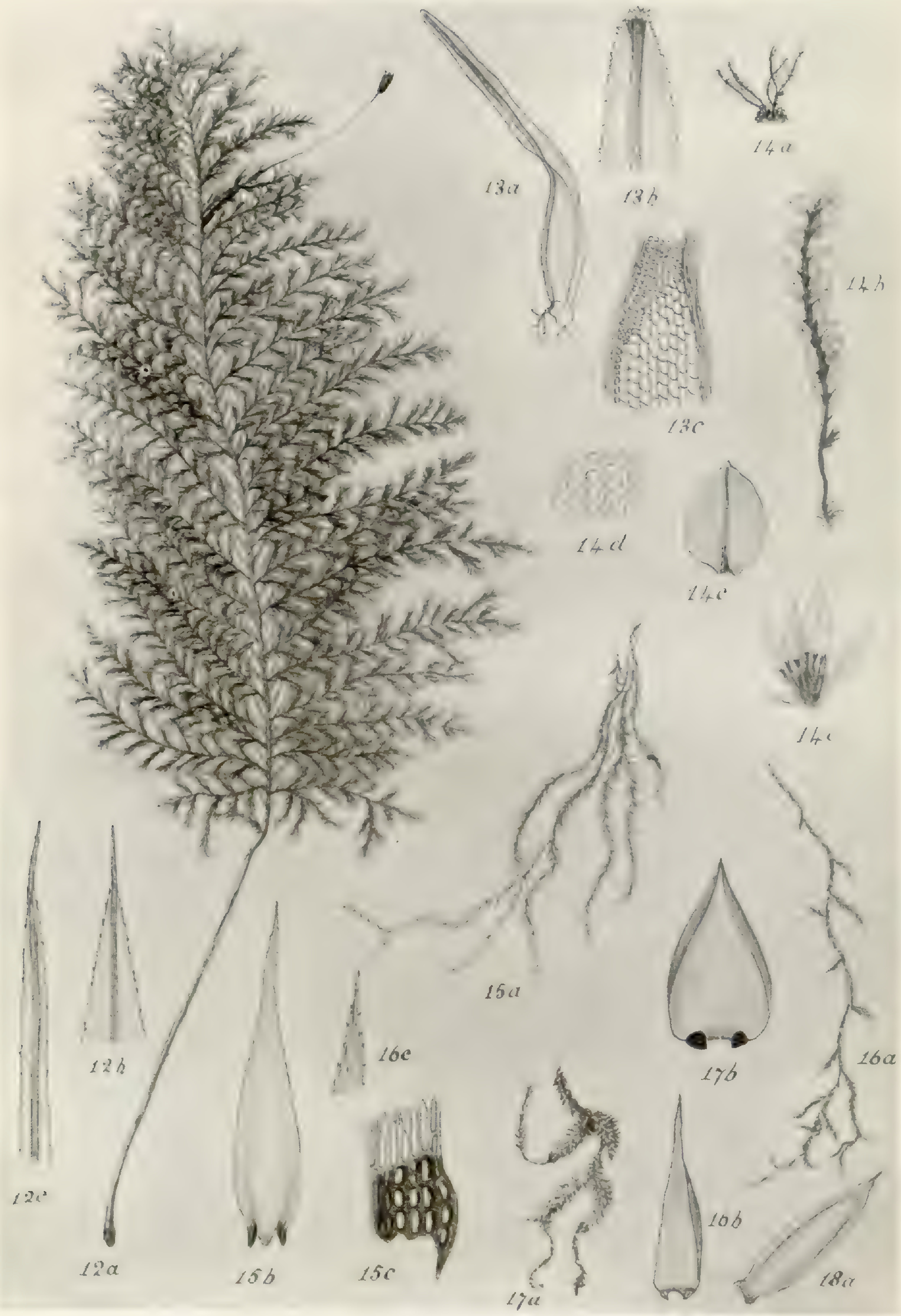
H. N. D. del.

MOSSES FROM NEW GUINEA.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MOSSES FROM NEW GUINEA.

The Fertilization of *Cephalanthera*, Rich.

By Colonel M. J. Godfery, F.L.S.

[Read 16th June, 1921.]

Cephalanthera is a genus of the Orchidaceæ, of which three species grow in Britain—*grandiflora*, *ensifolia*, and *rubra*. It will help us to understand its fertilization if we first glance at that of *Epipactis*, the nearest allied genus, as seen in *E. latifolia*, a common British species, fertilized by wasps. The pollinia are built up of an immense number of tetrads, each consisting of four pollen-grains, closely compressed. Projecting forwards over the edge of the stigma is the rostellum, or viscid gland, a milky-looking ball of very adhesive matter, to the back of which the two pollinia are already firmly attached when the flower opens.

This is so placed in the flower that a wasp coming to suck nectar is sure to touch it. Immediately the rostellum, with the two pollinia attached, adheres to the insect's head, and when it enters another flower the pollinia come in contact with the stigma, and leave quantities of pollen on its viscid surface.

The tetrads soon split up into their component pollen-grains, each of which emits a pollen-tube, which grows downwards till it reaches the ovules and fertilizes them. This may be called fertilization by the principle of the *viscid gland*, a method which, in endless variety of detail, prevails almost throughout the Orchidaceæ, except in Diandræ. The variations are often extremely curious, but the root-principle is the same in all—the provision of a mass of very adhesive material by the rostellum, which cements the pollinia to a visiting insect.

When we try to find out how *Cephalanthera* is fertilized, we are met at the outset by an apparently insuperable difficulty—there is no rostellum whatever. The conspicuous flowers are well-suited to attract insects, but there is a complete absence of the usual mechanism for the removal of the pollinia.

Darwin investigated the fertilization of *C. grandiflora*, the commonest British species. He found that the curved pollinia lean forward and rest on the upper edge of the stigma, to which they become anchored by pollen-tubes a little below their centres, their upper parts projecting forwards over the edge of the stigma. These, which he likened to two pillars of pollen, he believed became broken down by minute insects, so that fragments fell down and adhered to the sticky surface of the stigma, the flower being thus fertilized by its own pollen. He therefore concluded that *grandiflora* was constantly self-fertilized (Fert. Orch. 1890, p. 85), and stated (*l. c.* p. 242) that the rostellum and its vessels were completely aborted, and that the pollen-grains were not cemented into tetrads as in almost all other orchids (*l. c.* p. 80). He expressed his belief that *Cephalanthera* was a degraded *Epipactis*, that is, an *Epipactis* which has lost its rostellum, and with it the possibility of cross-pollination by insects.

In March 1920 I was at Hyères, on the Riviera, where *ensifolia* was frequent. On dissecting its flowers I found that in many cases the pollinia had disappeared without leaving a trace behind. Presently I opened a flower in which *both* pollinia were still in the anther perfect and intact, but adhering to the stigma were one whole pollinium and portions of another. These must evidently have come from some other flower. It was now clear (1) that pollinia are by some means bodily removed from a large number of flowers, (2) that in some flowers pollen is deposited on the stigma from some outside source. This seemed to indicate that insects visit the flowers, remove the pollinia, and transfer them to the stigma of another flower, but how could this be possible, in view of the absence of a rostellum to provide the necessary viscid material?

I next observed that if the anther was pressed back on its hinge, it at once resumed its former position when released. Normally it leans forward, so that the curved pollinia rest on the edge of the stigma. To ascertain whether they become anchored there by pollen-tubes, as described by Darwin in the case of *grandiflora*, I pressed back the anther with a needle. It moved easily, carrying the pollinia with it. These were quite free, without the slightest trace of adhesion to the edge of the stigma. When I released the anther, it sprang smartly back, with so much elasticity that in one case both pollinia were flung bodily out of the flower. What is the object of this elastic spring-hinge?

Delpino suggested (Ult. Osserv. sulla dicog. Part ii. 1875, p. 149) that the viscid secretion with which the stigma is always coated might be sufficient, if an insect became smeared with it, to remove the pollinia. To test this I inserted a dry camel's-hair brush into a flower, and caused it to sweep gently upwards along the middle of the stigma and the face of the anther. It came out with one whole pollinium attached to it by the middle, the ends pointing outwards. With a lens I could see a little viscid matter glistening on the brush. But why was only one pollinium removed? On looking into the flower I found the anther was empty—evidently one pollinium had been previously removed. I did the same thing with another flower, and this time both pollinia were readily withdrawn. I repeated the experiment with flower after flower, always with the same result. To make sure that the removal of the pollinia was really due to the viscid matter of the stigma, I passed a clean brush over the face of the anther in several flowers, without first touching the stigma. This had no effect—the pollinia would not adhere to a dry brush. The object of the elastic hinge now became apparent. The anther must be pressed against the back of the stigma, so that the pollinia may project far enough forward to ensure that an insect, retreating backwards from a flower, after smearing himself with the viscid matter of the stigma, shall also brush against the pollinia. These at once adhere by their convex centres, their ends pointing forwards. It is these projecting ends which come into contact with the stigma of the next flower visited. This explains the curious fact that pollinia are occasionally found adhering to the stigma by their extreme tips, their curved centres standing away quite clear of its surface.

In April 1920 I found *grandiflora* (the species which Darwin investigated) at Hyères, where it is rare. On inserting a brush into the flower, it came out with the greater part of the pollinia attached. As in *ensifolia*, the viscid secretion is sufficiently copious to remove the pollinia, but there is this difference. If the flower is visited before the pollinia have become anchored to the edge of the stigma, they can be removed entire, but if already anchored only their upper portions can be withdrawn. *Grandiflora*, therefore, is not necessarily always self-fertilized. To my surprise, for at that time I believed self-fertilization alone to be possible, I once saw *grandiflora* visited by a humble-bee, *Bombus lucorum*, in Surrey *. In my eagerness to secure the bee for identification, I caught it at once. As it bore no pollinia I regarded the visit as a purely accidental occurrence. I now think that, had I refrained from catching it, I might have witnessed the actual removal of pollinia by a humble-bee. Nevertheless, *grandiflora* is nearly always self-fertilized. I examined numbers of flowers at Vence, but only found two from which the pollinia had been withdrawn. At Mantes, near Paris, I also found two flowers from which one pollinium, and one from which both pollinia, had been removed.

Our third species, the beautiful rose-red *Cephalanthera rubra*, I found at Vence in May 1920. The pollinia were readily removed with a brush, as in *ensifolia* and *grandiflora*. As I happened to have a dead bee of just the right size (*Osmia leiana* ♂), caught sleeping in a flower of *Serapias longipetala* (Gard. Chron. 1920, p. 70), I resolved to see how it would answer with *C. rubra*. Grasping it with my forceps I inserted it into a flower, withdrawing it so that it lightly brushed against the stigma and anther. On the very first trial both pollinia were removed with ease.

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* Since this paper was read, I gathered (June 21st) three small spikes of *C. grandiflora* near the same spot where *Bombus lucorum* was seen to visit the flowers on June 7th, 1919, from two flowers of which both the pollinia had been removed. There was no pollen on the stigmas.

I believe that *Cephalanthera* is a very ancient genus, which shows us the earliest method of cross-pollination in the Orchidaceæ, before a rostellum had yet been evolved in that Order. If it had once possessed a rostellum and subsequently lost it, we should almost certainly be able to find some rudiment still extant, in the same way that staminodes exist to the present day in many orchids, including *Cephalanthera*, to represent suppressed stamens. No sign of even a rudimentary rostellum can be found, nor could Darwin detect any trace of the spiral vessel belonging to it in *grandiflora* (*l. c.* pp. 239, 242). Further evidence of the antiquity of *Cephalanthera* is afforded by the fact that the pollen-grains are not cemented into tetrads as in almost all other orchids. This seems to indicate that it shows us the simplest primæval form in which the pollen-grains existed before their assembly into tetrads, the massing of tetrads into packets, the building up of packets to form pollinia, and the development of caudicles had yet taken place.

Cephalanthera not only shows us how cross-pollination was possible before a rostellum had yet come into existence, but it also enables us to form some idea as to how that unique organ first came to be evolved. It is easy to see that pollination through insects becoming smeared with the viscid secretion of the stigma had this disadvantage, that it weakened the power of the stigma to detach pollen from any pollinia brought into contact with it, especially if several insect-visits occurred in succession. If, therefore, the upper of the three stigmas, which from its position was most likely to suffer such loss, were to secrete more abundant viscid matter (which might very well happen through a natural effort to replace loss), it would be a distinct advantage to the plant. This increase of secretion might easily be augmented by natural selection in the course of time, till the upper stigma secreted enough viscid fluid to form a *distinct drop*, when we should have a rostellum in embryo. It only then needs to acquire a very thin covering membrane—just enough to prevent the enclosed viscid matter from drying up—to present us with the simplest form of rostellum, such as we find in *Epipactis*.

It was unfortunate that Darwin selected *grandiflora* for his experiments—an exceptional species fertilized in an exceptional manner,—and that he was tempted to generalize from one species to the whole genus and pronounce *Cephalanthera* a degraded *Epipactis*. Far from this being the case, *Cephalanthera* was probably a well-established genus before *Epipactis* came into being. *Cephalanthera* was not derived by retrogression from *Epipactis*, it is much more likely that the latter was formerly fertilized in some such manner as now obtains in *Cephalanthera*, and has subsequently acquired its rostellum Had Darwin been able to examine *ensifolia* and *rubra*, both of which grow in England, though they are extremely rare and local, he would assuredly have discovered their simple method of cross-pollination.

That *ensifolia* and *rubra* are both entirely dependent on insects for pollination is proved by the fact that if the flowers are not so visited no seed-capsules are produced; one often sees fruiting spikes of both species in which only a flower here and there has set a capsule. *C. grandiflora can* be fertilized in this manner, but this does not seem to happen very often, for it is rare to find flowers from which the pollinia have been removed. It is, however, regularly self-fertilized, for practically every flower produces a capsule—a sure sign that pollination is automatic and quite independent of any outside agency. How has this come about in a plant whose conspicuous flowers are evidently adapted to attract insects? It is still quite capable of cross-pollination, and this probably occurs on the whole much more frequently than the examination of a limited number of specimens out of the thousands which exist might lead us to suppose. But it is a shade-loving plant, rarely seen except under the shelter of trees, and often growing in deep shadow. In the woods, however, the number of insects of suitable size is much more restricted than in the open. There was thus a danger of there not being enough insects to secure adequate cross-pollination. It has, therefore, acquired the power of self-fertilization, but it should be carefully noted that this is *in addition to,* not in replacement of, the capability of cross-pollination. It is a parallel case with that of *Ophrys apifera*, which has supplemented its original faculty of cross-pollination by adding to it that of self-fertilization. In both cases cross-pollination appears to be frequent enough to keep the mechanism for that purpose in efficient working order, whilst self-fertilization enables the plants to keep up their numerical standard in years when insects are scarce. There is no decadence or degeneration in this. Instances occur in other Natural Orders in which provision is made for self-fertilization, if cross-pollination fails to take place, and many insect-fertilized plants increase their numbers by purely vegetative means, such as additional bulbs, creeping rhizomes, etc. It would be absurd to interpret the provision of such additional safeguards against unfavourable contingencies as a sign of decadence or degeneracy.

If I am challenged to produce proof that effective cross-pollination has actually occurred in *Cephalanthera*, I can point to the hybrids *C. grandiflora* × *C. ensifolia* found on Mont Salève near Geneva (A. & G. Syn. iii. 877) and *C. grandiflora* × *Epipactis rubiginosa*, found in Austria, which flowered several times in the botanic gardens at Vienna (*l. c.* 883). These hybrids could not possibly have occurred in a state of nature, except through effective visits by the same insect to both parents in each case.

In the 'Journal of Botany,' 1920, p. 71, I protested against Dr. Wettstein's proposal to abolish the genus *Cephalanthera* and to include it in *Epipactis*, Cr. I then adopted Darwin's view and said:—"*Cephalanthera* is a decadent genus which has fallen from its high estate, assuming that it is really the case that it is entirely self-fertilized, and that we have not simply so far failed to understand the mechanism of the flower." I had then had no opportunity of studying the fertilization of *ensifolia* and *rubra*. Now that I have done so I am convinced that both these species are wholly cross-pollinated by insects, and that this is also the case occasionally with *grandiflora*, though its subsequently acquired faculty of self-fertilization has now become the dominant factor in its reproduction.

I do not now believe that there has been any decadence or degeneration in *Cephalanthera*, but that it presents a case of persistence to the present day of an extremely ancient method of cross-pollination, which possibly prevailed universally in the Orchidaceæ (except in Diandræ) in the remote period before a rostellum had been evolved in that Order.

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